

1911

**PROCEEDINGS**

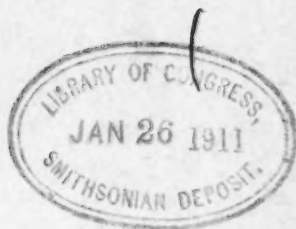
**OF THE**

**AMERICAN SOCIETY**

**OF**

**CIVIL ENGINEERS**

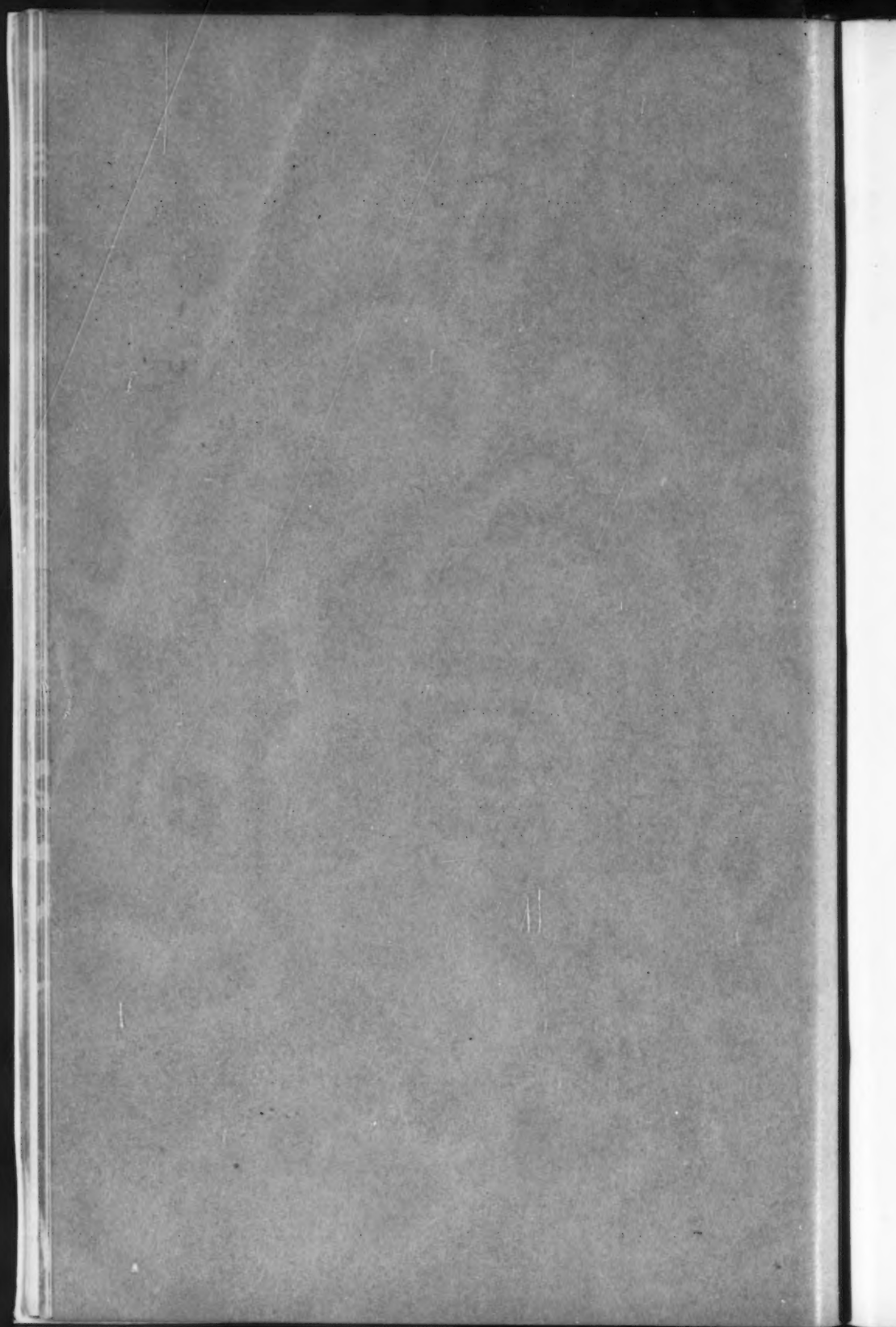
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PROCEEDINGS  
OF THE  
AMERICAN SOCIETY  
OF  
CIVIL ENGINEERS  
(INSTITUTED 1852)

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VOL. XXXVII—No. 1  
JANUARY, 1911

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NEW YORK 1911.

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# American Society of Civil Engineers

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ON BITUMINOUS MATERIALS FOR ROAD CONSTRUCTION: W. W. Crosby, A. W. Dean, H. K. Bishop, A. H. Blanchard.

The House of the Society is open from 9 A. M. to 10 P. M. every day, except Sundays, Fourth of July, Thanksgiving Day, and Christmas Day.

HOUSE OF THE SOCIETY—220 WEST FIFTY-SEVENTH STREET, NEW YORK.

TELEPHONE NUMBER.....5913 Columbus.

CABLE ADDRESS....."Ceas, New York."



## AMERICAN SOCIETY OF CIVIL ENGINEERS

INSTITUTED 1852

## PROCEEDINGS

This Society is not responsible, as a body, for the facts and opinions advanced  
in any of its publications.

## SOCIETY AFFAIRS

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### MINUTES OF MEETINGS OF THE SOCIETY

**December 21st, 1910.**—The meeting was called to order at 8.30 P. M.; Vice-President Pegram in the chair; Chas. Warren Hunt, Secretary; and present, also, 64 members and 19 guests.

A paper by Morton L. Tower, M. Am. Soc. C. E., entitled "Notes on the Bar Harbors at the Entrances to Coos Bay, and Umpqua and Siuslaw Rivers, Oregon," was presented by title, and the Secretary read a written communication on the subject by Lewis M. Haupt, M. Am. Soc. C. E.

A paper by Walter Buehler, M. Am. Soc. C. E., entitled "Timber Preservation, Its Development and Present Scope," was presented by the Secretary, and the subject was discussed orally by Messrs. Richard Lamb, George W. Tillson, Ernest F. Hartmann, and A. L. Dean.

The Secretary announced the following deaths:

HENRY PURDON BELL, elected Member, June 4th, 1884; date of death unknown.

WILLIAM ROBERT BROWNE, elected Member, June 1st, 1898; died September 3d, 1908.

Adjourned.

**January 4th, 1911.**—The meeting was called to order at 8.30 p. m.; Director Gardner S. Williams in the chair; Chas. Warren Hunt, Secretary; and present, also, 111 members and 22 guests.

The minutes of the meetings of November 16th and December 7th, 1910, were approved as printed in *Proceedings* for December, 1910.

A paper by Henry Earle Riggs, M. Am. Soc. C. E., entitled "The Valuation of Public Service Corporation Property," was presented by title, and the subject was discussed orally by Messrs. F. Lavis, Charles H. Higgins, J. Martin Schreiber, and Charles Hansel.

The Secretary reported that he had received a number of written communications on the subject, but owing to the time taken up by the oral discussion they were not read.

The Secretary announced the election of the following candidates on January 3d, 1911:

AS MEMBERS.

HARRY CLARK DELANO, Manila, Philippine Islands.

PERCY WALKER EARLY, Cedar Bluff, Va.

JAMES ZACHARIAH GEORGE, Memphis, Tenn.

MICHAEL CREED HINDERLIDER, Denver, Colo.

EDGAR STANISLAUS VON PIONTKOWSKI, Manila, Philippine Islands.

FRANK THOMAS WESTCOTT, North Attleborough, Mass.

AS ASSOCIATE MEMBERS.

WALTER HENRY ALLEN, Chehalis, Wash.

HAROLD WILLOUGHBY BENEDICT, Troy, N. Y.

CLAYTON WASS BOWLES, Glendive, Mont.

PERCY LEWIS BRAUNWORTH, Roseland, N. J.

HENRY JOHN BRUNNIER, San Francisco, Cal.

MILLARD ANGLE BUTLER, Spokane, Wash.

ROBERT FRANKLIN EWALD, Provo, Utah.

GEORGE FARNSWORTH FISK, Buffalo, N. Y.

JOHN ROBERT GRANT, New York City.

JOHN ALEXANDER GRIFFIN, Lynchburg, Va.

GEORGE FOSTER HARLEY, Jackson, Ga.

LEVI BATES LINCOLN, Houlton, Me.

FRANK IRWIN LOUCKES, Louisville, Ky.

JAMES HENRY MANNING, Franklin, N. H.

ARTHUR THEODORE PETERSON, Nashville, Tenn.  
JOHN CARLETON PHILLIPS, Fort Flagler, Wash.  
OTTO CHARLES JULIUS PODEWILS, New York City.  
JAMES FRANCIS QUIRK, Brown Station, N. Y.  
FRANCIS OREA RENSHAW, Richmond, Va.  
WILLIAM PATRICK VALLELY, New York City.  
GEORGE ALBERT WALL, Denver, Colo.  
HORACE PRETTYMAN WARREN, Cristobal, Canal Zone, Panama.  
HARRISON ALLEN WHITNEY, Portland, Ore.

As ASSOCIATE.

ROBERT ERNEST BELKNAP, Chicago, Ill.

As JUNIORS.

TRACY BARTHOLOMEW, Denver, Colo.  
EDWIN ROY BOWERMAN, Fairport, N. Y.  
JOHN HENRY BRINGHURST, Ann Arbor, Mich.  
KARL WALTHALL BRITTAIN, Atlanta, Ga.  
GEORGE BRYAN, JR., Chicago, Ill.  
WILLIAM EDWARD HAMILTON, Pennington, Ala.  
HARRY ALBERTUS HELLING, Poughkeepsie, N. Y.  
CHRISTIAN HUTH, Chicago, Ill.  
ROBERT BURT LEETE, Detroit, Mich.  
ANTONIO SEBASTIAN LUCCHETTI-OTERO, Ponce, Porto Rico.  
FRANK HENRY MACY, Inlet, N. Y.  
ALEXANDER WICLIFFE MUIR, Newton, N. J.  
FRANCIS RAYMOND NITCHIE, Washington, D. C.  
ASA BERTRAND SEGUR, Manila, Philippine Islands.  
JULIUS HERSCHEL SERRA, Brooklyn, N. Y.  
ARTHUR PORTER SMYTH, Helena, Mont.  
FRANCIS TINGLEY, Walden, N. Y.  
JAMES BALDWIN WARRACK, Seattle, Wash.

The Secretary announced the transfer of the following candidates on January 3d, 1911:

FROM ASSOCIATE MEMBER TO MEMBER.

WARREN MARTIN ARCHIBALD, Houston, Tex.  
ROBERT CRARY BARNETT, Kansas City, Mo.  
WILLIAM LARAMY BUTCHER, Cambridge, Mass.  
HERBERT JAMES CHAMBERS, New York City.  
FREDERICK BERNHARDT DUIS, Wheeling, W. Va.  
NELSON ANDREW ECKART, San Francisco, Cal.  
JAMES EASTON FERGUSON, Toledo, Ohio.  
GEORGE ROGERS HECKLE, Alberton, Md.

JOHN CLARENDON McCLURE, Tucson, Ariz.  
JOHN LAROE MANN, Santo Domingo, Santo Domingo.  
MARSHALL NEY SHOEMAKER, Newark, N. J.  
ROBERT ANDREW THOMPSON, Wichita Falls, Tex.  
GEORGE MILLER WELLS, Gatun, Canal Zone, Panama.  
WILLARD OLNEY WHITE, Uniontown, Pa.

FROM JUNIOR TO ASSOCIATE MEMBER.

WILLIAM FRANKLIN COLLAR, Negaunee, Mich.  
IRVING DEAN GOODWIN, Des Moines, Iowa.  
SINCLAIR OLLASON HARPER, Grand Junction, Colo.  
FRANCIS BEAL MARSH, New York City.  
CROSBY MILLER, Steelton, Pa.  
AVALON GRAVES ROBERTSON, Bocas del Toro, Panama.  
EDWARD LAWRENCE SAYERS, Yonkers, N. Y.

The Secretary announced the following death:

WILLIAM PARSONS WATSON, elected Member, June 1st, 1887; died December 19th, 1910.

Adjourned.

OF THE BOARD OF DIRECTION

(Abstract)

**January 3d, 1911.**—Vice-President Pegram in the chair; Chas. Warren Hunt, Secretary; and present, also, Messrs. Bates, Belknap, Brackett, Churchill, Kimball, Stearns, Thompson, and Williams.

The matter of proposed legislation covering the practice of Civil Engineers was considered, and the draft of a bill, which had been made a special order for this meeting, was considered in detail, amended and adopted under the following resolution:

*"Whereas:* There are National Societies of Engineers in the United States, membership in which can only be secured after rigid examination of the fitness of applicants to practice as Engineers; and

*"Whereas:* The public has ample protection if they will employ only those who have thus demonstrated their ability; be it

*"Resolved:* That the Board of Direction of the American Society of Civil Engineers does not deem it necessary or desirable that Civil Engineers should be licensed in any State; and be it further

*"Resolved:* That if, notwithstanding this, the Legislature of any State deems the passage of a statute covering the practice of Civil Engineering desirable for the protection of the public, the accompanying draft\* of such a statute, which has been prepared by the Board as embodying proper requirements for that purpose, is recommended."

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\* See p. 7.

The resignation of C. C. Schneider, Past-President, Am. Soc. C. E., as a member of the Special Committee on Concrete and Reinforced Concrete, was received and accepted.

A report was received from the Committee to recommend the Award of Prizes for the year ending with *Transactions* for July, 1910, said Committee consisting of Messrs. Robert Ridgway, W. W. Curtis, and T. G. Dabney, and the recommendations of this Committee were adopted, the Norman Medal being awarded to C. E. Grunsky, M. Am. Soc. C. E., for his paper entitled "The Sewer System of San Francisco, and a Solution of the Storm-Water Flow Problem," and The Thomas Fitch Rowland Prize to John H. Gregory, M. Am. Soc. C. E., for his paper entitled "The Improved Water and Sewage Works of Columbus, Ohio." No award of the Collingwood Prize for Juniors was made.

The resignations of 2 Members, 5 Associate Members, 1 Associate, and 9 Juniors were accepted during the year, as taking effect December 31st, 1910.

Action was taken in regard to members in arrears for dues.

Ballots for membership were canvassed, resulting in the election of 6 Members, 23 Associate Members, 1 Associate, and 18 Juniors, and the transfer of 7 Juniors to the grade of Associate Member.

Fourteen Associate Members were transferred to the grade of Member.

Applications were considered, and other routine business transacted.

Adjourned.

## ANNOUNCEMENTS

The House of the Society is open from 9 A. M. to 10 P. M., every day, except Sundays, Fourth of July, Thanksgiving Day, and Christmas Day.

## FUTURE MEETINGS

**February 1st, 1911.—8.30 P. M.**—At this meeting a paper entitled "The Water-Works and Sewerage of Monterrey, N. L., Mexico," by George Robert Graham Conway, M. Am. Soc. C. E., will be presented for discussion.

This paper was printed in *Proceedings* for December, 1910.

**February 15th, 1911.—8.30 P. M.**—A paper by E. D. Hardy, M. Am. Soc. C. E., entitled "Water Purification Plant, Washington, D. C., Results of Operation," will be presented for discussion.

This paper was printed in *Proceedings* for December, 1910.

**March 1st, 1911.—8.30 P. M.**—At this meeting a paper entitled "The Pittsburg and Lake Erie Railroad Cantilever Bridge Over the Ohio River at Beaver, Pa.," by Albert R. Raymer, M. Am. Soc. C. E., will be presented for discussion.

This paper is printed in this number of *Proceedings*.

**March 15th, 1911.—8.30 P. M.**—A paper by Arnold C. Koenig, Assoc. M. Am. Soc. C. E., entitled "Dams on Sand Foundations: Some Principles Involved in Their Design, and the Law Governing the Depth of Penetration Required for Sheet-Piling," will be presented for discussion.

This paper is printed in this number of *Proceedings*.

### THE LICENSING OF CIVIL ENGINEERS.

Resolutions adopted by the Board of Direction, January 3d, 1911.

"WHEREAS: There are National Societies of Engineers in the United States, membership in which can only be secured after rigid examination of the fitness of applicants to practice as Engineers; and

"WHEREAS: The public has ample protection if they will employ only those who have thus demonstrated their ability; be it

"RESOLVED: That the Board of Direction of the American Society of Civil Engineers does not deem it necessary or desirable that Civil Engineers should be licensed in any State; and be it further

"RESOLVED: That if, notwithstanding this, the Legislature of any State deems the passage of a statute covering the practice of Civil Engineering desirable for the protection of the public, the accompanying draft of such a statute, which has been prepared by the Board as embodying proper requirements for that purpose, is recommended."

### AN ACT TO PROVIDE FOR THE LICENSING OF CIVIL ENGINEERS.

1 The people of the State of \_\_\_\_\_, represented in Senate and  
2 Assembly, do enact as follows:

3 SECTION 1.—After May 1st, 19\_\_\_\_, no person shall practice Civil  
4 Engineering within the meaning of this Act in the State of \_\_\_\_\_  
5 unless authorized by license from the State Board of Engineering  
6 Examiners, as required by this Act.

7 SECTION 2. — PRACTICE OF CIVIL ENGINEERING. — Civil  
8 Engineering, within the meaning of this Act, is the practice of any branch  
9 of the Profession of Engineering other than Military. Said Profession  
10 embraces the design and supervision of the construction of public or  
11 private utilities, such as Railroads, Bridges, Highways, Roads, Canals,  
12 Harbors, River Improvements, Lighthouses, Irrigation Works, Water  
13 Supplies, Sanitary and Drainage Works, of works for the Development,  
14 Transmission, and Application of Power, and of Electrical, Mechanical,  
15 Mining, Industrial, Hydraulic, Municipal, Sanitary, Structural, and  
16 other works which require experience and the same technical knowledge  
17 as Engineering Schools of recognized reputation prescribe for  
18 graduation.

19 The enumeration of any public or private utilities or works in this  
20 section shall not be held to exclude from said Profession the design and  
21 supervision of other public or private utilities or works which require  
22 experience and like technical knowledge.

23 SECTION 3. — STATE BOARD OF ENGINEERING EXAMINERS. —  
24 A State Board of Engineering Examiners of nine (9) members shall be



25 appointed by the Governor, each of whom, except as hereinafter  
26 provided, shall hold office for six (6) years from May 1st of the year in  
27 which he is appointed. In constituting the first Board to be appointed  
28 under this Act, the Governor shall designate three (3) members to serve  
29 for two (2) years from May 1st, 19—; three (3) members to serve for  
30 four (4) years from May 1st, 19—; and three (3) members to serve for  
31 the full term of six (6) years from May 1st, 19—.

32 Thereafter, the Governor shall appoint biennially three (3) members  
33 for the full term of six (6) years, to fill the vacancies caused by expiration  
34 of term of office, and may, at any time, fill vacancies in the Board for  
35 the unexpired term caused by death, resignation, or removal from office.  
36 The Governor may remove any member of the Board of Examiners for  
37 misconduct, incapacity, or neglect of duty.

38 Each member of the Board of Engineering Examiners shall be a  
39 Professional Civil Engineer at least thirty-five (35) years of age, shall  
40 have had at least ten (10) years' active practice, be of recognized  
41 standing in the Profession, and be licensed under this Act. He shall  
42 have been a resident of the State of \_\_\_\_\_ for one (1) year  
43 immediately preceding his appointment.

44 Wherever the words "the Board" are used in this Act they mean  
45 the State Board of Engineering Examiners provided for by this Section.

46 SECTION 4.—CERTIFICATE OF APPOINTMENT, OATH, POWERS.—  
47 Every member of the Board shall receive a certificate of appointment  
48 from the Governor, and before beginning his term of office shall file with  
49 the Secretary of State the constitutional oath of office. Each member of  
50 the first Board shall receive a license under this Act from said Board  
51 when organized.

52 The Board, or any committee thereof, shall be entitled to the counsel  
53 and services of the Attorney General, shall have the power to compel  
54 the attendance of witnesses, and may take testimony and proofs  
55 concerning all matters within its jurisdiction.

56 The Board shall adopt a seal which shall be affixed to all licenses  
57 granted, and may make all by-laws and rules, not inconsistent with law,  
58 needed in performing its duty; but no by-law or rule by which more  
59 than a majority vote is required for any specified action by the Board  
60 shall be amended, suspended, or repealed by a smaller vote than that  
61 required for action thereunder.

62 SECTION 5.—EXPENSES.—The fees derived from the operation of  
63 this Act shall be paid into the State Treasury, and the Legislature shall  
64 annually appropriate amounts sufficient to pay all proper expenses  
65 incurred pursuant to this Act.

66 Warrants for the payment of expenses incurred shall be issued by  
67 the Comptroller, and paid by the State Treasurer upon presentation of  
68 vouchers regularly drawn and approved by the President and Secretary  
69 of the Board.

70 On or before the first day of February in each year, the Board shall  
71 submit to the Legislature a written report of its proceedings for the  
72 preceding year, and shall file with the Secretary of State a copy of  
73 said report, together with a complete statement of the receipts and  
74 expenditures of the Board, attested by the affidavits of the President  
75 and Secretary, and a complete register of those licensed to practice Civil  
76 Engineering under this Act, with their addresses and the dates of their  
77 licenses.

78 SECTION 6.—OFFICERS, MEETINGS, QUORUM, COMMITTEES.—The  
79 Board shall biennially elect from its members a President and a Vice-  
80 President for the ensuing biennial term.

81 The Board shall appoint a Secretary, who shall not be a member of  
82 the Board, but who shall have the same qualifications as herein  
83 required for members thereof. He shall hold office during the pleasure  
84 of the Board, and shall receive an annual compensation of \_\_\_\_\_  
85 dollars. He shall give a bond with sureties to be approved by  
86 the Board conditioned for the faithful performance of his duties and  
87 for the accounting, and payment over, of all moneys received by him.

88 The Secretary shall keep a record on file in the office of the Board  
89 of all licenses granted, and shall receive and account for all fees derived  
90 from the operation of this Act. He shall perform all other duties which  
91 may from time to time be assigned to him by the Board.

92 The Board shall hold at least six (6) stated meetings in each year.  
93 Special meetings may be called at other times by the President or by  
94 three (3) members of the Board. At least ten (10) days' notice of all  
95 meetings shall be given.

96 At any meetings of the Board three (3) members shall constitute a  
97 quorum.

98 SECTION 7.—ADMISSIONS TO EXAMINATION.—The Board shall

99 admit to examination any candidate who pays a fee of \_\_\_\_\_ dollars  
100 and submits evidence, verified by oath and satisfactory to the Board  
101 that he

102 (1) is more than twenty-one (21) years of age,

103 (2) is of good character,

104 (3) has been engaged actively in Civil Engineering work, as assistant  
105 or otherwise, for at least six (6) years, and has had charge of Engineering  
106 work for at least one (1) year,

107 (4) or, is a graduate from a school of Engineering of recognized  
108 reputation, and has been engaged actively in Civil Engineering work, as  
109 assistant or otherwise, for at least four (4) years, and has had charge of  
110 Engineering work for at least one (1) year.

111 SECTION 8.—LICENSES WITHOUT EXAMINATIONS.—The Board  
112 shall issue a license, upon due application therefor, and the payment of  
113 a fee of \_\_\_\_\_ dollars, within one (1) year after this Act takes effect,  
114 to any candidate furnishing evidence satisfactory to said Board, that the  
115 candidate is qualified for admission to examination as prescribed in  
116 Section 7 hereof and has practiced Civil Engineering for an additional  
117 period of not less than four (4) years immediately preceding. After the  
118 expiration of said period of one (1) year, the Board shall issue licenses  
119 only as hereinafter provided.

120 SECTION 9.—EXAMINATIONS.—Examinations for license shall be  
121 given at stated or called meetings of the Board, which shall be held at  
122 various places within the State, at the selection of the Board. The scope  
123 of the examinations and the methods of procedure shall be prescribed by  
124 the Board. The examinations may be either oral or written, or partly  
125 oral and partly written, but shall be as nearly uniform as is reasonably  
126 possible in each specialty covered. As soon as practicable after the  
127 close of each examination a certificate shall be filed in the office of  
128 the Secretary of the Board, signed by the members conducting such  
129 examination. Said certificate shall show the action of the Board upon  
130 each application, whereupon the Secretary of the Board shall notify each  
131 applicant of the result of his examination. If a candidate fails on first  
132 examination, he may, after an interval of not less than six (6) months,  
133 nor more than one (1) year, have a second examination without  
134 additional fee.

135 SECTION 10.—LICENSES.—Upon the payment of an additional fee

136 of \_\_\_\_\_ dollars any applicant who has been certified as having passed  
137 the prescribed examination shall receive a license to practice, signed by  
138 the President and Secretary of the Board, under its seal, which license  
139 shall state that the applicant has given satisfactory evidence of fitness as  
140 to age, character, education and training, and all other matters required  
141 by this Act, and that, after examination, he has been found properly  
142 qualified to practice.

143 The Board shall, from time to time, examine the requirements for  
144 licenses in other States, and shall register those in which, in the  
145 judgment of said Board, standards not lower than those provided by this  
146 Act are maintained. Upon the presentation, by a resident of a State so  
147 registered, to the Secretary of said Board, of satisfactory evidence that  
148 he holds a license issued by proper authority in such State, or upon the  
149 presentation, by a Civil Engineer resident in a State not so registered, of  
150 satisfactory evidence that he is qualified as prescribed in Section 7 hereof  
151 and has practiced Civil Engineering for an additional period of not less  
152 than four (4) years immediately preceding his application, accompanied  
153 in either case by a fee of \_\_\_\_\_ dollars, the Secretary shall issue to him  
154 a license to practice Civil Engineering in the State of \_\_\_\_\_,  
155 whereupon the person to whom said license is issued shall be entitled to  
156 all the rights and privileges conferred by a license issued after  
157 examination by the Board.

158 Before any license is issued, it shall be numbered and recorded in a  
159 book kept for that purpose in the office of the Board, and its number shall  
160 be noted on the license. This register shall be open to public inspection,  
161 and in all legal proceedings the same or a transcript of any part thereof,  
162 certified by the Secretary of the Board under its seal, shall be entitled to  
163 admission in evidence.

164 No unlicensed person shall qualify as a witness before any State or  
165 Municipal Court as an expert in Civil Engineering.

166 No map, plan, or drawing required by law to be certified or approved  
167 by a Civil Engineer shall be accepted or filed by State or Municipal  
168 authority, unless the certification or approval is executed by a person  
169 duly licensed in accordance with the provisions of this Act.

170 SECTION 11. — REVOCATION OF LICENSE, ANNULMENT OF  
171 REGISTRY.—The Board shall have power at any and all times to inquire  
172 into the identity of any person claiming to be a licensed Civil Engineer,

173 and, after due service of notice in writing, require him to prove, to the  
174 satisfaction of said Board, that he is the person licensed to practice  
175 Civil Engineering under the license by virtue of which he claims the  
176 privilege of this Act. When the Board finds that a person claiming to be  
177 a Civil Engineer, licensed under this Act, is not in fact the person to  
178 whom the license was issued, the findings of the Board shall be reduced  
179 to writing and shall be filed in the office of the Board. Said certificate  
180 shall be *prima facie* evidence that the person mentioned therein is falsely  
181 impersonating a practitioner or a former practitioner of a like or different  
182 name.

183 The Board may revoke the license of a practitioner and annul his  
184 registration, if said practitioner has been guilty of any fraud or deceit in  
185 his practice, or has been guilty of any fraud or deceit by which he  
186 was granted a license to practice, or has been convicted of crime.

187 When charges are preferred, the Board shall designate six (6) of its  
188 number, as a committee, to hear and determine said charges. A time  
189 and place for the hearing shall be fixed by the said committee as soon as  
190 convenient, and a copy of the charges, together with a notice of the time  
191 and place when they will be heard and determined, shall be served upon  
192 the accused or his counsel at least ten (10) days before the date actually  
193 fixed for said hearing. Where personal service, or service upon counsel,  
194 cannot be effected, and such fact is certified on oath by any person duly  
195 authorized to make legal service, the Board shall cause to be published  
196 for at least seven (7) times, for at least twenty (20) days prior to the  
197 hearing, in two daily papers in the section of the State in which the  
198 accused was last known to practice, a notice to the effect that at a  
199 definite time and place a hearing will be had on the charges against the  
200 accused upon an application to revoke his license. At said hearing the  
201 accused shall have the right to cross-examine witnesses and to produce  
202 witnesses in his defence, and to appear personally or by counsel.  
203 The said committee shall make a written report of its findings and  
204 recommendations, and the same shall be submitted forthwith to the  
205 Board. If the said committee shall by a two-thirds vote recommend  
206 that the license of the accused be revoked and his registration annulled,  
207 the Board may thereupon, in its discretion, revoke said license and  
208 annul said registration. If the Board shall revoke said license, its action  
209 shall be recorded in the same manner as licenses are registered, and

210 the name of the accused shall be stricken from the list of Licensed  
211 Civil Engineers.

212 SECTION 12. — CERTIFICATE PRESUMPTIVE EVIDENCE. —  
213 UNAUTHORIZED REGISTRATION AND LICENSE PROHIBITED.—Every  
214 unrevoked certificate and endorsement of registry, made as provided in  
215 this Act, shall be presumptive evidence in all courts and places that the  
216 person named therein is legally registered.

217 No diploma or license conferred on a person, other than by the  
218 Board, or its Secretary, shall be lawful authority for the practice of Civil  
219 Engineering within the meaning of this Act.

220 SECTION 13.—PENALTIES AND THEIR COLLECTION.—Any person  
221 who, not being then lawfully authorized to practice Civil Engineering  
222 within this State according to the provisions of this Act, shall attempt to  
223 practice, or shall so practice, and any such person who shall, in  
224 connection with his name, use any designation tending to imply or  
225 designate him as a practitioner of Civil Engineering within the meaning  
226 of this Act, and any person who shall have violated the provisions of  
227 this Act, shall be deemed guilty of a misdemeanor. Any person  
228 presenting, or attempting to file as his own, the license of another, or  
229 who shall give either false or forged evidence of any kind to the Board,  
230 or to any member thereof, in connection with an application for a  
231 license to practice Civil Engineering, or who shall practice Civil  
232 Engineering under a false or assumed name, or who shall falsely  
233 personate another practitioner of a like or different name, shall for each  
234 offense be punished by a fine of not less than \$100 nor more than \$500,  
235 or by imprisonment for three (3) months, or by both such fine and  
236 imprisonment.

237 SECTION 14.—This Act shall not apply to engineers working for  
238 the United States Government; nor to any engineer employed as an  
239 assistant to an engineer licensed to practice Civil Engineering in the State  
240 of \_\_\_\_\_; nor to any engineer coming from another State and  
241 employed by the State or any municipality, corporation, firm, or  
242 individual therein, until a sufficient time shall have elapsed to permit  
243 the licensing of such person.

244 SECTION 15.—This Act shall take effect on the first day of May,  
245 19—.



## LOCAL ASSOCIATIONS OF MEMBERS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

### San Francisco Association

The San Francisco Association of Members of the American Society of Civil Engineers holds regular bi-monthly meetings, with banquet, and weekly informal luncheons. The former are held at 6 p. m., at the Palace Hotel, on the third Friday of February, April, June, August, October, November, and December, the last being the Annual Meeting of the Association.

Informal luncheons are held at 12.15 p. m. every Wednesday, and the place of meeting may be ascertained by communicating with the Secretary of the Association, E. T. Thurston, Jr., Assoc. M. Am. Soc. C. E., 713 Mechanics' Institute, 57 Post Street.

The by-laws of the Association provide for the extension of hospitality to any members of the Society who may be temporarily in San Francisco, and any such member will be gladly welcomed as a guest of the Association at any of the above meetings, if he will notify the Secretary that he is in San Francisco.

### Colorado Association

The meetings of the Colorado Association of Members of the American Society of Civil Engineers are held on the second Saturday of each month except July and August. The hour and place of meeting are not fixed, but this information will be furnished on application to the Secretary, H. J. Burt, M. Am. Soc. C. E., 1218 First National Bank Building, Denver, Colo. The meetings are usually preceded by an informal dinner.

Weekly luncheons are held on Wednesdays, and until further notice, will take place at The Colorado Traffic Club.

Visiting members are urged to attend the meetings and luncheons.

### (Abstract of Minutes of Meeting)

**December 10th, 1910.**—The meeting was called to order at 8.15 p. m.; President Anderson in the chair; H. J. Burt, Secretary; and present, also, 32 members and 17 guests.

The minutes of the November meeting were read and approved.

Charles W. Comstock, M. Am. Soc. C. E., presented a paper on "The Principles Involved in the Design of Earth Dams," and the subject was discussed by a number of those present.

The Committee on Legislation presented a final draft of the Bill for Licensing Civil Engineers, and, on motion, was authorized to present this bill to the Legislature.

On motion it was ordered that the bill be printed and distributed among the members after it shall have been approved by the Committee on Licensing Civil Engineers of the American Society of Civil Engineers.

Adjourned.



**PRIVILEGES OF ENGINEERING SOCIETIES  
EXTENDED TO MEMBERS OF THE  
AMERICAN SOCIETY OF CIVIL ENGINEERS**

Members of the American Society of Civil Engineers will be welcomed by the following Engineering Societies, both to the use of their Reading Rooms and at all Meetings:

- American Institute of Mining Engineers**, 29 West Thirty-ninth Street, New York City.
- Architekten-Verein zu Berlin**, Wilhelmstrasse 92, Berlin W. 66, Germany.
- Associação dos Engenheiros Cíveis Portuguezes**, Lisbon, Portugal.
- Australasian Institute of Mining Engineers**, Melbourne, Victoria, Australia.
- Boston Society of Civil Engineers**, 715 Tremont Temple, Boston, Mass.
- Brooklyn Engineers' Club**, 117 Remsen Street, Brooklyn, N. Y.
- Canadian Society of Civil Engineers**, 413 Dorchester Street, West, Montreal, Que., Canada.
- Civil Engineers' Society of St. Paul**, St. Paul, Minn.
- Cleveland Engineering Society**, 718 Caxton Building, Cleveland, Ohio.
- Cleveland Institute of Engineers**, Middlesbrough, England.
- Colorado Association of Members, Am. Soc. C. E.**, H. J. Burt, Secy., 1218 First National Bank Building, Denver, Colo.
- Engineers' and Architects' Club of Louisville, Ky.**, 303 Norton Building, Fourth and Jefferson Streets, Louisville, Ky.
- Engineers' Club of Baltimore**, Baltimore, Md.
- Engineers' Club of Minneapolis**, 17 South Sixth Street, Minneapolis, Minn.
- Engineers' Club of Philadelphia**, 1317 Spruce Street, Philadelphia, Pa.
- Engineers' Club of St. Louis**, 3817 Olive Street, St. Louis, Mo.
- Engineers' Club of Toronto**, 96 King Street, West, Toronto, Ont., Canada.
- Engineers' Society of Pennsylvania**, 219 Market Street, Harrisburg, Pa.
- Engineers' Society of Western Pennsylvania**, 2511 Oliver Building, Pittsburg, Pa.
- Institute of Marine Engineers**, 58 Romford Road, Stratford, London, E., England.
- Institution of Engineers of the River Plate**, Buenos Aires, Argentine Republic.

**Institution of Naval Architects**, 5 Adelphi Terrace, London, W. C., England.

**Junior Institution of Engineers**, 39 Victoria Street, Westminster, S. W., London, England.

**Koninklijk Instituut van Ingenieurs**, The Hague, The Netherlands.

**Louisiana Engineering Society**, 321 Hibernia Bank Building, New Orleans, La.

**Memphis Engineering Society**, Memphis, Tenn.

**Midland Institute of Mining, Civil and Mechanical Engineers**, Sheffield, England.

**Montana Society of Engineers**, Butte, Montana.

**North of England Institute of Mining and Mechanical Engineers**, Newcastle-upon-Tyne, England.

**Oesterreichischer Ingenieur- und Architekten-Verein**, Eschenbachgasse 9, Vienna, Austria.

**Pacific Northwest Society of Engineers**, 803 Central Building, Seattle, Wash.

**Rochester Engineering Society**, Rochester, N. Y.

**Sachsischer Ingenieur- und Architekten-Verein**, Dresden, Germany.

**Sociedad Colombiana de Ingenieros**, Bogota, Colombia.

**Sociedad de Ingenieros del Peru**, Lima, Peru.

**Societe des Ingenieurs Civils de France**, 19 Rue Blanche, Paris, France.

**Society of Engineers**, 17 Victoria Street, Westminster, S. W., London, England.

**Svenska Teknologforeningen**, Brunkebergstorg 18, Stockholm, Sweden.

**Tekniske Forening**, Vestre Boulevard 18-1, Copenhagen, Denmark.

**Western Society of Engineers**, 1737 Monadnock Block, Chicago, Ill.

### SEARCHES IN THE LIBRARY

In January, 1902, the Secretary was authorized to make searches in the Library, upon request, and to charge therefor the actual cost to the Society for the extra work required. Since that time many searches have been made, and bibliographies and other information on special subjects furnished.

The resulting satisfaction, to the members, who have made use of the resources of the Society in this manner, has been expressed frequently, and leaves little doubt that, if it were generally known to the membership that such work would be undertaken, many would avail themselves of it.

The cost is trifling compared with the value of the time of an engineer who looks up such matters himself, and the work can be

performed quite as well, and much more quickly, by persons familiar with the Library.

In asking that such work be undertaken, members should specify clearly the subject to be covered, and whether references to general books only are desired, or whether a complete bibliography, involving search through periodical literature, is desired.

In reference to this work, the Appendices\* to the Annual Reports of the Board of Direction for the years ending December 31st, 1906, and December 31st, 1910, contain summaries of all searches made to date.

### PAPERS AND DISCUSSIONS

Members and others who take part in the oral discussion of the papers presented are urged to revise their remarks promptly. Written communications from those who cannot attend the meetings should be sent in at the earliest possible date after the issue of a paper in *Proceedings*. The issue of volumes of *Transactions* is dependent on the closing of discussions, and the co-operation of the membership in this matter is essential to the regular issue of each quarterly volume.

All papers accepted by the Publication Committee are classified by the Committee with respect to their availability for discussion at meetings.

Papers which, from their general nature, appear to be of a character suitable for oral discussion, will be published as heretofore in *Proceedings*, and set down for presentation to a future meeting of the Society, and, on these, oral discussions, as well as written communications, will be solicited.

All papers which do not come under this heading, that is to say, those which, from their mathematical or technical nature, in the opinion of the Committee, are not adapted to oral discussion, will not be scheduled for presentation to any meeting. Such papers will be published in *Proceedings* in the same manner as those which are to be presented at meetings, but written discussions, only, will be requested for subsequent publication in *Proceedings* and with the paper in the volumes of *Transactions*.

### SUBSCRIPTION PRICE TO THE PUBLICATIONS OF THE SOCIETY

The following subscription rates have been fixed by the Board of Direction for the publications of the Society:

*Proceedings*, ten Numbers per annum, \$8. Price for single numbers, \$1.

*Transactions*, four Volumes per annum, \$12. Price for single volumes, \$4.

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\**Proceedings*, Vol. XXXIII, p. 20 (January, 1907); Vol. XXXVII, p. 28 (January, 1911).

On the above prices there is a discount of 25% to members who desire extra copies of any of these publications, to Libraries, and to Book-dealers.

There is also an additional charge per annum, to cover foreign postage, of 75 cents for *Proceedings* and \$1 for *Transactions*, or 8 cents and 25 cents, respectively, for single numbers.

A special subscription rate has been fixed by the Board for the *Proceedings* of the Society for the benefit of Students in Technical Schools. This rate is \$4.50 per annum, and is available to any *bona fide* student of any technical school.

# ANNUAL REPORT OF THE BOARD OF DIRECTION FOR THE YEAR ENDING DECEMBER 31st, 1910.

In compliance with the Constitution, the Board of Direction presents its report for the year ending December 31st, 1910.

## MEMBERSHIP.

The changes in membership are shown in the following table:

GRADE.	JAN. 1ST, 1910.			JAN. 1ST, 1911.			LOSSES.				ADDI- TIONS.		TOTALS.	
	Resident.	Non-Resident.	Total.	Resident.	Non-Resident.	Total.	Transfer.	Resignation.	Dropped.	Death.	Transfer.	Election.	Loss.	Gain.
Honorary Members.....	.....	2	2	.....	2	2	.....	.....	.....	.....	.....	.....	.....	.....
Corresponding Members.....	.....	2	2	.....	2	2	.....	.....	.....	.....	.....	.....	.....	.....
Members.....	564	2 008	2 567	597	2 170	2 767	.....	4	3	35	*111	131	42	242
Associate Members.....	430	1 399	1 829	454	1 630	2 084	108	6	9	9	+112	\$275	132	387
Associates.....	71	93	164	78	92	170	5	1	1	3	‡4	\$12	10	16
Juniors.....	151	550	701	153	592	745	114	6	22	5	.....	191	147	191
Fellows.....	6	15	21	6	15	21	.....	.....	.....	.....	.....	.....	.....	.....
Total.....	1 222	4 070	5 292	1 288	4 509	5 797	227	17	35	52	227	609	331	836

\* 108 Associate Members, 1 Associate, and 2 Juniors.

† 4 Associates and 108 Juniors.

‡ 4 Juniors.

§ 2 Reinstatements.

This table shows that the net increase during the year was 505.

In the last Annual Report statistics of the yearly growth of the Society for 39 years were given. It seems, therefore, necessary only to call attention to the fact that, while 1910 has shown the largest yearly increase in membership, that increase is not abnormal, the average yearly increase for the past 4 years having been 470.

The number of applications received during 1910 was 955: 706 for admission, and 249 for transfer.

The losses by death reported during the year number 52, and are as follows:

Members (35): James Archbald, John Fiske Barnard, Henry Purdon Bell, William Foster Biddle, Linus Weed Brown, William Robert Browne, Clifford Buxton, Octave Chanute, George Earl Church, Edwin Peleg Dawley, Camille Stanislaus d'Inwilliers, John Hall Emigh, Joseph Palmer Frizell, Charles Edward Goad, Henry Harding, Charles Alfred Hasbrouck, Henry Cyprian Humphrey, William Jackson, Washington Jones, Edward Cornelius Kinney, William Storrs MacHarg, John Edwards McKay, John Jay McVean, Henry Herman Marden, Jr., Samuel R. Probasco, Stillman Williams Robinson, Samuel McMath

Rowe, John Henderson Sample, Albert Mather Smith, Archibald Alexander Sproul, William Wright Starr, George Huntington Thomson, Jacobus Van der Hoek, William Parsons Watson, Henry Donald Whitcomb.

Associate Members (9): John Joseph Horan, Roger Brooke Irwin, Vardry Echols McBee, Jr., William Meier, Clinton Leroy Richardson, Ralph Carroll Soper, Norman Alfred Taylor, Frank Wallace Webster, George Shreve Wilkins.

Associates (3): Silas Gildersleeve Comfort, Julius I. Livingston, James Roosevelt Shanley.

Juniors (5): Earl Edwin Erdmann, Luther Elman Johnson, Harold Lord, Arthur Keddie Macfarlane, George Higgins Myers.

### LIBRARY.

The total contents of the Library, and the increase during the year, are shown in the following statement:

	Total Contents.	Increase during 1910.
Bound volumes.....	19 553	960
Unbound volumes .....	37 985	1 742
Specifications .....	6 769	97
Maps, photographs and drawings....	4 313	70
Total .....	68 620	2 869

Of these accessions, 744 were donations received in answer to special requests; 81 were donations from publishers; 1898 were donations received in regular course, and 146 were purchased.

The value of accessions to the Library during the year is as follows, each accession having been valued separately as received:

2 723 Donations and exchanges (estimated value) .....	\$2 103.43
146 Volumes purchased (cost).....	443.88
Binding 381 volumes.....	445.59
Total .....	\$2 992.90

The following amounts have been expended upon the Library during the year:

Purchases, subscription, and binding.....	\$889.47
Fixtures, supplies, and sundries.....	237.95
Total .....	\$1 127.42

The number of titles in the Library is 24 906.

The total attendance in the Reading Room and Library during the year was 3 994.

During the year 66 new bibliographies (containing 2 138 separate references) have been made, copies of 18 searches made in previous years have been furnished, 6 of these having been brought up to date. The total cost of this work, \$442.39, has been charged to those for whom it was undertaken.

A classified list of the 229 searches which had been made to that date was published as an Appendix to the Annual Report for 1906, and in order to bring that list up to date there is appended to this report, a similar list of the 278 searches made during the past four years (1907-1910).

### PUBLICATIONS.

During the year, ten numbers of *Proceedings* have been issued regularly, and four volumes of *Transactions*.

In *Proceedings* the list of references to current engineering literature has been continued, and has covered 110 pages and contained 4 350 classified references to 100 periodicals.

The stock of the various publications of the Society, kept on hand for the convenience of members and others, now amounts to 152 274 copies, the cost of which to the Society, for paper and presswork only, has been \$21 215.51.

During the year, 13 890 volumes of *Transactions* have been bound for members and others in the standard half-morocco and cloth bindings.

#### SUMMARY OF PUBLICATIONS FOR 1910.

	Issues.	Average Edition.	Total Pages.	Plates.	Cuts.
<i>Transactions</i> (volumes).....	4	6 100	2 160	173	309
<i>Proceedings</i> (monthly numbers)...	10	6 000	2 378	210	308
Constitution and List of Members.	1	6 500	404	...	1
Totals.....	15	.....	4 942	383	618

The cost of publications has been:

For Paper, Printing, etc., <i>Transactions</i> and <i>Proceedings</i> ...	\$27 558.98
For Plates and Cuts.....	4 440.89
For Boxes, Mailing Lists, Copyright, and Sundry Expenses.	1 097.00
For 11 750 Extra Copies of Papers and Memoirs.....	1 303.24
For List of Members.....	1 962.12

Total ..... \$36 362.23

Deduct amount received from sale of publications..... 4 583.54

Net cost of publications for 1910..... \$31 778.69

It was originally the intention to publish the series of papers descriptive of the Pennsylvania Terminal Work in New York City



as the third of the quarterly volumes of *Transactions* for 1910. It was found, however, that collectively these papers could not be printed in one volume, and the plan was to issue an extra volume, making five volumes for 1910. Unfortunately, the author of the last of this series of papers has been unable to complete it, and so the first of these volumes (No. 68) has been issued, and the publication of the second (No. 69) will have to be deferred until that paper is finished.

The large cost of Publications is, in part, accounted for by the fact that nearly half of Volume 69 has gone through the press, and, in part, by the many illustrations needed in the description of the Pennsylvania Terminal work.

#### MEETINGS.

During the year 25 meetings have been held as follows: At the Annual Meeting, 2; at the Annual Convention, 5; and 18 other meetings held at the Society House.

At these meetings there were presented 29 formal papers, 13 of which were illustrated with lantern slides. There were also 7 papers published in *Proceedings* which were not presented for discussion at any meeting of the Society. The number of members and others who took part in the preparation or discussion of these papers was 177.

The Forty-second Annual Convention was held at Chicago, Ill.

The total attendance at the 25 meetings held was about 2700. The registered attendance at the Annual Meeting was 827, and at the Annual Convention 315 (includes members only), but there were many members and guests present at all these meetings who failed to register.

#### MEDALS AND PRIZES.

For the year ending with the month of July, 1909, prizes were awarded as follows:

The Norman Medal to J. A. L. Waddell, M. Am. Soc. C. E., for his paper entitled "Nickel Steel for Bridges."

The Thomas Fitch Rowland Prize to W. J. Wilgus, M. Am. Soc. C. E., for his paper entitled "The Electrification of the Suburban Zone of the New York Central and Hudson River Railroad in the Vicinity of New York City."

The Collingwood Prize for Juniors to H. L. Wiley, Jun. Am. Soc. C. E., for his paper entitled "The Sinking of the Piers for the Grand Trunk Pacific Bridge, at Fort William, Ontario, Canada."

#### FINANCES.

During the year \$10 000 was paid on the principal of the Mortgage on the Society Property, reducing this debt to \$135 000. A Reserve Fund has also been established and \$17 000 invested in non-taxable bonds of the City of New York. The interest received from this

fund is somewhat greater than that paid on the mortgage debt, and at the same time a fund is provided which may be drawn upon in case of necessity, or used to extinguish said mortgage debt at maturity, or, if deemed desirable, before that date. The Board has ordered that \$10 000 be paid on the principal of the mortgage early in 1911, and that \$20 000 be added to the Reserve Fund.

The attention of members is invited to the Secretary's statement of receipts and disbursements, and to the general balance sheet which accompanies it, in which the financial condition of the Society is shown.

The reports of the Secretary and Treasurer are appended.

By order of the Board of Direction,

CHAS. WARREN HUNT,  
*Secretary.*

JANUARY 3D, 1911.

REPORT OF THE SECRETARY FOR THE  
TO THE BOARD OF DIRECTION OF THE

GENTLEMEN:—I have the honor to present a statement of Receipts 31st, 1910. I also append a general balance sheet showing the condition

RECEIPTS.

Balance on hand December 31st, 1909, in Bank, Trust Company, and in hands of Treasurer.....		\$44 668.67
Entrance Fees.....	\$15 140.00	
Current Dues .....	63 003.55	
Past Dues .....	2 437.91	
Advance Dues .....	25 485.12	
Compounding Dues .....	250.00	
Certificates of Membership.....	681.25	
Badges .....	2 902.75	
Sales of Publications.....	4 583.54	
Library .....	341.15	
Annual Meeting.....	1 265.25	
Binding .....	11 993.38	
Interest .....	1 292.89	
Miscellaneous .....	332.11	
	<hr/>	129 708.90

\$174 377.57

## YEAR ENDING DECEMBER 31st, 1910.

## AMERICAN SOCIETY OF CIVIL ENGINEERS.

and Disbursements for the fiscal year of the Society, ending December of the affairs of the Society.

Respectfully submitted,

CHAS. WARREN HUNT,  
*Secretary.*

## DISBURSEMENTS.

Salaries of Officers.....	\$12 800.00	
Mileage of Directors.....	1 040.34	
Clerical Help.....	15 015.33	
Caretaking .....	1 780.26	
Publications .....	36 362.23	
Postage .....	7 985.17	
General Printing and Stationery.....	3 412.97	
Library .....	889.47	
Library Maintenance .....	237.95	
Badges .....	1 725.50	
Certificates of Membership.....	480.40	
Binding .....	7 341.11	
Prizes .....	169.10	
Convention .....	683.52	
Annual Meeting.....	2 164.96	
Maintenance of House.....	72.72	
Heat, Light and Water.....	1 305.79	
Furniture .....	494.40	
Work of Committees.....	352.67	
Interest and Insurance.....	6 015.55	
Bond and Mortgage (Payment on Principal)..	10 000.00	
Current Business.....	1 237.48	
Petty Expenses.....	212.24	
Members' Accounts.....	130.58	
Herbert Stewart Library Fund.....	1 997.50	
Joseph G. Swift Library Fund.....	998.75	
Reserve Fund.....	16 978.75	
		\$131 884.74
Balance on hand, December 31st, 1910:		
In Union Trust Company.....	\$19 422.75	
In Garfield National Bank.....	21 570.08	
In hands of Treasurer.....	1 500.00	
		42 492.83
		<u>\$174 377.57</u>

GENERAL BALANCE SHEET, DECEMBER 31ST, 1910.  
ACCOMPANYING THE REPORT OF THE SECRETARY.

ASSETS.		LIABILITIES.	
Three Lots (estimated value) (actual cost, \$189 632.11).....	\$375 000.00	Dues for 1911 paid in advance.....	\$25 485.12
Society Building (cost).....	170 955.59	Mortgage Debt.....	135 000.00
Furniture .....	19 247.64	Funds invested in Society House, Lots and Library.....	23 734.53
Publications on hand (inventoried cost) .....	21 215.51	Herbert Stewart Library Fund.....	1 997.50
Reserve and Special Funds invested in non-taxable New York City Bonds*	19 975.00	Gen. Joseph G. Swift Library Fund..	998.75
Library: Cash expended for books, etc.....	\$14 882.71	Surplus (including Reserve Fund)....	539 972.32
Donations, estimated....	58 068.97		
Due from Members.....	\$4 963.63		
Due from Non-Members...	386.34		
Cash .....	42 492.83		
	<u>\$727 188.22</u>		<u>\$727 188.22</u>

\* Reserve fund, \$16 978.75; Herbert Stewart Library fund, \$1 997.50; Joseph G. Swift Library fund, \$998.75.

We have examined the books and accounts of the American Society of Civil Engineers, for the year ended December 31, 1910, and certify that the foregoing Balance Sheet is in accordance therewith, and, in our opinion, correctly states the condition of the Society's affairs, as shown by the books.

79 WALL STREET, NEW YORK.

JANUARY 12, 1911.

MARWICK, MITCHELL & Co.,  
Chartered Accountants.

## REPORT OF THE TREASURER.

In compliance with the provisions of the Constitution, I have the honor to present the following report for the year ending December 31st, 1910:

Balance on hand December 31st, 1909.....	\$44 668.67	
Receipts from current sources, January 1st to December 31st, 1910.....	129 708.90	
Payment of Audited Vouchers for Current Business, January 1st to December 31st, 1910 .....	\$101 909.74	
Payment on principal of bond and mortgage..	10 000.00	
Purchase of bonds, Herbert Stewart Library Fund .....	1 997.50	
Purchase of bond, Joseph G. Swift Library Fund .....	998.75	
Purchase of bonds, Reserve Fund.....	16 978.75	
Balance on hand December 31st, 1910:		
In Union Trust Company.....	\$19 422.75	
In Garfield National Bank.....	21 570.08	
In hands of the Treasurer.....	1 500.00	
	<hr/>	42 492.83
	<hr/>	<hr/>
	\$174 377.57	\$174 377.57

Respectfully submitted,

JOS. M. KNAP,  
*Treasurer, Am. Soc. C. E.*

NEW YORK, JANUARY 3D, 1911.

APPENDIX  
TO ACCOMPANY ANNUAL REPORT OF  
THE BOARD OF DIRECTION.

CLASSIFIED LIST OF SUBJECTS OF LIBRARY SEARCHES:  
January, 1907, to December, 1910.

NOTE: To Members the cost of copies of these searches is  
50% of the cost given.

BRIDGES

No.	Cost.	No. of Ref.	
297	\$3.15	16	Ohio River Bridges Between Pittsburg and Ironton (1907 Complete).
298	3.15	8	Concrete Filled Steel Shell Caissons for Bridge Piers (1907 Partial).
309	6.75	50	Evolution of Bridge Engineering and History of Bridge Building (1907 Complete).
310	3.25	19	Aesthetics of Bridge Design (1907 Complete).
311	3.15	26	Aerial Ferries (1907 Complete).
316	9.45	19	Combined Railway, Highway, Street Railway and Pedestrian Bridges in America (1907 Partial).
318	4.40	11	Impact on Bridges (1907 Partial).
319	10.00	42	Deflection of Bridges under Loads (1907 Complete).
323	13.30	83	Bridge Failures and Their Lessons (1907 Partial).
324	4.75	16	Borings for Bridge Foundations (1907 Partial).
325	1.70	6	Location of Bridges (1907 Partial).
326	2.25	13	Determination of Waterways for Culverts (1907 Partial).
329	20.00	122	Live Loads and Specifications for Steel Highway Bridges and Electric Railway Bridges (1907 Partial).
331	.75	3	Rockville Stone Arch Bridge (1907 Partial).
343	10.15	56	Open Caissons for Bridge Pier and other Foundations (1908 Partial).
358	1.50	9	Weights of Steel Railroad Bridges (1908 Partial).
375	4.05	17	Cantilever Bridges (1908 Partial).
385	2.80	14	Economic Design and Proportion of Steel Railroad Bridges (1908 Partial).
386	2.70	23	Bridge Floors (1908 Partial).
421	1.80	2	Viaduct from Hoboken to Jersey City Heights (1909 Partial).
425	.60	5	Thebes Bridge (1909 Partial).
426	.50	4	The Memphis Bridge (1909 Partial).
427	.50	4	Cairo Bridge (1909 Partial).
438	.70	2	Bridge at Louisville, Kentucky, over the Ohio River (1909 Partial).
513	2.00	2	Illustrations of Bridges over the Royal Gorge and Apache Canon, and of Rio Santa Railroad in Peru (1910 Partial).
525	3.40	25	Reinforced Concrete Arches Constructed before 1905 (1910 Partial).
526	2.60	10	Concrete Arch Bridges, Reinforced Transversely and Longitudinally with Round Rods Near the Intrados (1910 Partial).

ELECTRICAL

322	2.35	19	Reinforced Concrete Posts and Telegraph Poles 1903-07 (1907 Partial).
352	5.85	45	Electrical Conduits—Plans and Municipal Ownership (1908 Partial).
371	11.05	25	Costs of Laying Underground Conduits for Use of Electric Light, Power, Telephone and Telegraph Wires in Various Cities in the Last Ten Years (1908 Partial).
507	2.75	15	Appraisal of Telephone and Telegraph Companies (1910 Partial).
528	3.50	36	Reinforced Concrete Poles (1910 Partial).



## MARINE

No.	Cost.	No. of Ref.	
289	\$14.20	289	Dry Docks (1907 Complete).
361	1.25	17	Screw Propellers (1908 Partial).
429	2.25	18	Brooklyn Dry Docks (1909 Partial).
461	5.00	11	Concrete Barges (1909 Partial).

## MECHANICAL

287	1.00	16	Use of Cooling Towers in Connection with Steam Condensing Plants (1907 Partial).
302	4.75	22	Manufacture of Illuminating Gas in Boston and New York (1907 Complete).
314	4.00	24	Distilling Water for Use in Boilers (1907 Complete).
332	.75	3	Koppers Coke Oven (1907 Partial).
378	4.30	32	Reinforced Concrete Coaling Stations and Coal Storage Bins 1900-07 (1908 Complete).
387	3.50	15	Cost of Operating Modern Cold Storage Buildings and Plants (1908 Partial).
406	4.85	17	Pneumatic Conveyors (1909 Partial).

## METALLURGICAL

272	4.50	60	Reduction of Bauxite and the Manufacture of Aluminum and Aluminum Products (1907 Complete).
492	3.65	5	Relative Heat Required to Reduce Calcite and Dolomite Stone in a Blast Furnace (1910 Partial).
493	7.00	30	Relative Efficiency of Beehive and By-Product Coke in the Operation of a Blast Furnace (1910 Complete).

## MINING

283	2.35	7	Stone or Ore Crushing Machinery, Crushing Pieces Fifteen Inches or Larger (1907 Partial).
435	.90	8	Development of Oil Fields in Texas (1909 Partial).
436	.45	3	Development of the Anthracite Coal Fields of Arkansas (1909 Partial).
469	4.65	40	Concrete-Lined Shafts (1910 Complete).
496	5.50	26	Mining by Means of Winzes or Glory Holes (1910 Partial).

## MISCELLANEOUS

261	1.25	10	Laying Out of Standard Race Tracks for Harness Horses (1907 Partial).
266	6.75	47	Peat: Its Use as a Fuel, etc.; Location of Principal Peat Beds (1907 Complete).
307	24.10	62	Cost Allowances in Per Cent. Made for Engineering, Contractor's Profit, and for Expense for Organizing Corporations in Estimates for Public Works (1907 Partial).
340	6.20	29	Preparation and Manufacture of Coal-Tar and Asphalt (1908 Complete).
349	.90	6	Cost Keeping and Methods of Estimating Cost (1908 Partial).
350	6.55	36	Details of the Cost of Construction (1908 Partial).
365	2.70	17	Hydraulic Excavation (1908 Partial).
372	10.70	48	Ozone and Its Uses (1908 Partial).
403	3.85	10	Rate Per Cent. at which an Annual Income should be Capitalized to Determine the Value of Appraisal of Award (1909 Partial).
404	1.10	8	Fish Glue (1909 Partial).
407	15.75	277	Cotton Industry (1909 Complete).
424	4.30	40	Bonus, Premium and Piece Work Systems of Remunerating Labor (1909 Partial).
441	1.35	5	Oil Refineries in Texas (1909 Complete).
468	4.00	37	Engineering Office Records (1910 Partial).
497	4.75	40	Oil Transportation (1910 Partial).
519	5.15	25	Early German Engineers in the United States (1910 Complete).
530	.80	9	Natural Gas in Louisiana, Ohio and Other Parts of the United States (1910 Partial).

## MUNICIPAL

No.	Cost.	No. of Ref.	
251	\$3.15	20	Use of Asphalt Blocks and Their Comparison with Brick Paving (1907 Partial).
265	11.50	175	Street Cleaning (Covers Collection of City Refuse, but not Disposal) (1907 Complete).
267	4.25	39	Statistics of Street Paving Other than New York City, 1896 to date (1907 Complete).
317	8.10	78	The Use of Tar, Bitumen, Oil, Cement, etc., on Macadam Roads, Before and After Construction (1907 Complete).
356	6.55	69	Repair and Maintenance of Telford and Macadam Roads (1908 Partial).
383	5.40	22	Different Methods of Making Assessments for Brick Pavements or Other Street Improvements (1908 Partial).
418	1.95	18	Specifications for Macadam Roads (1909 Partial).
472	3.50	14	Action of Illuminating Gas on Asphalt Pavements (1910 Partial).

## RAILROADS

253	3.00	19	Railroad Embankments Carried Over Swamps (1907 Complete).
256	7.65	27	Slips of Earthwork (1907 Complete).
258	5.15	98	Construction of Long Railroad Tunnels (Includes Search No. 53) (1907 Partial).
260	7.00	74	Motor Cars, Electric, Gasoline, Compressed Air (1907 Partial).
182	1.25	6	Prices of Steel Rails (1906 Partial).
262	9.90	132	Rack Railroads (Includes Search No. 230) (1907 Complete).
277	2.00	14	New York Central Type of Under-Contact Third Rail (1907 Partial).
279	2.60	24	Cross-Sections of Single-Track Railway Tunnels in the United States (1907 Partial).
285	4.75	42	Intensity of Pressure Between Locomotive and Car Wheels and Rails (1907 Partial).
290	7.05	44	Passenger and Freight Cars Used in Tropical Countries on Broad or Narrow Gauge Railroads, 1898-1907 (1907 Complete).
292	10.00	7	Time for Leaving Arch Centers in Place to Support Concrete Lining for Railroad Tunnels (1907 Complete).
304	4.95	79	Tunnel Construction (1907 Partial).
313	.50	1	Prior Location and Occupation of Right of Way (1907 Partial).
320	5.85	84	Construction of the Mont Cenis, St. Gothard, Arlberg and Simplon Tunnels (1907 Complete).
327	4.30	4	Cost of Driving Subaqueous Tunnels, Nine Feet or Greater in Diameter and One to Two Thousand Feet in Length, by Means of Compressed Air (1907 Partial).
333	28.40	227	Track Elevation and Depression in Cities (1908 Complete).
336	.75	1	Average Speed with Which Freight is Handled (1908 Partial).
337	5.00	31	Hungarian Government System of Railway Rates (1908 Complete).
341	.50	5	Brennan Gyroscope Railway (1908 Partial).
344	.50	1	The Nationalization of Swiss Railways (1908 Partial).
347	3.40	7	Limit Usually Assigned for Batter of Retaining Walls (1908 Partial).
351	5.65	52	Economics of Curve and Grade Reduction (1908 Partial).
357	7.00	28	Marginal Railroad in West Street, New York City (1908 Complete).
364	2.00	6	Density of Population in Relation to Earnings of Interurban Railways (1908 Partial).
367	3.75	17	Crossing of Steam Railroads at Grade and the Regulations Governing the Operation of Trains at Such Points (1908 Partial).
368	1.05	9	Ogden-Lucin Cut-Off (1908 Partial).
370	4.50	34	Car Ferries, including Transfer Bridges, Inclines, Cradles or Elevators and Other Accessories (1908 Partial).
373	4.05	24	Intercontinental Railway (Pan-American) (1908 Complete).
374	17.35	216	Narrow versus Broad Gauges for Railroads (1908 Complete).
379	4.95	75	Driving Tunnels in Earth (1908 Partial).
392	.50	7	Pennsylvania Railroad Tunnels under the Hudson River, and Terminal in New York City (1908 Partial).
397	.90	12	Detroit River Tunnel (1908 Partial).
398	1.65	18	Monorail Railways (Includes Search No. 341) (1908 Partial).
399	2.05	27	Catenary Construction (1908 Partial).

## RAILROADS—(Continued.)

No.	Cost.	No. of Ref.	
400	\$1.50	10	Data Relating to Accidents to Passengers and Employees on Railroads (1908 Partial).
409	.90	2	Pressures on Culverts in High Embankments (1909 Partial).
428	.70	7	Florida East Coast Railway, Key West Extension (1909 Partial).
444	4.05	35	Reinforced Concrete Retaining Walls (1909 Partial).
445	3.40	4	Cost of Operating Railroad Yards (1909 Partial).
452	2.15	8	Quotations on Prices for Angle-Bars and Track Bolts with Square Nuts (Mill Prices) (1909 Complete).
467	9.00	78	Rail Specifications (1910 Complete).
475	4.25	9	The Relation of the Reduction of Grades and Curves, etc., in Railroads to Operating Expenses (1910 Partial).
476	1.75	22	Electrification of Steam Railroads, Advantages and Disadvantages (1910 Partial).
490	9.65	41	Strength and Wear upon Large Cables (1910 Complete).
498	35.50	356	Subaqueous Tunnels (1910 Partial).
500	2.60	2	Oil Paint for Roundhouses (1910 Partial).
508	2.25	7	Economic Result of Double-Tracking Railroads (1910 Complete).
520	15.00	176	Electrification of Steam Railways (1910 Partial).
529	5.35	18	Tunnel-Boring Machines for Tunnels in Rock (1910 Partial).

## RAILROADS, STREET

248	2.25	8	Construction of Street Railway Track, 1905-06, in Streets Paved with Vitrified Brick (1907 Partial).
249	7.50	13	Vibrations in Buildings Caused by Traffic in Tunnels or Underground Railways (1907 Complete).
342	1.90	35	Third Avenue Railway, New York City (1908 Complete).
417	1.35	10	Subaqueous Tunnel Built by the Boston Transit Commission at Boston, Massachusetts (1909 Partial).
447	2.60	3	Cost of Track, Pole and Wire Work of Overhead Trolley Systems in City Streets (1909 Partial).
531	1.15	20	Names of Managers of Street Railways in Certain European Cities (1910 Complete).
532	10.40	83	Zone System—Rates of Fare in Certain European Cities (1910 Partial).

## SANITATION

240	10.00	4	Methods of Securing Samples of Subaqueous Mud (1906 Complete).
305	6.25	20	Tests of Strength in Vitrified Sewer Pipe (Includes Search No. 239) (1907 Complete).
306	2.25	8	Coefficient of Friction in Vitrified Sewer Pipe (1907 Complete).
334	7.65	83	Land Reclamation by Drainage (1907 Partial).
359	5.40	19	Incinerators for the Destruction of Sludge (1908 Partial).
366	4.05	19	Durability of Small Cement Pipe (1908 Partial).
393	1.50	4	Deaths by Typhoid Fever at Pittsburg, Pa. (1908 Partial).
419	4.95	43	Siphons for Sewerage Systems (1909 Partial).
431	1.60	9	Memphis Sewerage System (1909 Partial).
437	.70	5	Drainage of Swamp Lands in the South (1909 Partial).
440	.90	9	New Orleans Sewerage and Water Works Systems (1909 Partial).
453	2.15	8	Drainage of the Florida Everglades (1909 Complete).
455	9.90	39	Screens Used in the Treatment of Sewage (1909 Partial).
460	5.00	7	The Absorption of Water and the Action of Frost on Vitrified Sewer Pipe (1909 Complete).
470	6.15	39	Submerged Sewer Outfalls (1909 Partial).
477	3.25	25	Grit Chambers for Sewers (1910 Partial).
481	3.65	19	Assessments for Farm Drainage (1910 Complete).
484	2.75	24	Purification of Sewage Containing Waste from Cotton and Woolen Mills (1910 Partial).
486	6.40	22	Durability and Strength of Concrete Sewers (1910 Partial).
487	3.25	11	Wear of Sewer Inverts (1910 Complete).
491	5.15	24	Sewage Disposal—Plants and Experimental Works in Germany (1910 Partial).
510	3.50	14	Amount of Infiltration of Ground-Water into Sewers (1910 Complete).
512	8.65	44	Comparative Statements of Typhoid Fever Percentages, Before and After Improvement of Water Supplies (1910 Partial).

## SANITATION—(Continued.)

No.	Cost.	No. of Ref.	
514	\$4.00	24	Sewer Gauging, Dry-Weather Flow (1910 Partial).
518	6.75	28	The Amount of Bids or Cost of Sewers over Twenty-one Inches in Diameter Actually Built in Newark, Orange, East Orange, Montclair, Bloomfield and Newark or Hackensack Meadows (1910 Complete).
527	8.30	21	Use of Wooden Stave Pipe for Sewers (1910 Complete).

## STRUCTURAL

250	4.95	15	Illustrations Showing Layout and Floor Plans of Hospital Buildings (1907 Partial).
252	1.00	3	Cypress Wood for Piles (1907 Partial).
257	1.15	7	Specifications, Methods, etc., for Building Water-proof Reinforced Concrete Reservoirs (1907 Partial).
259	5.75	55	Failure of Reinforced Concrete Structures (1907 Complete).
278	5.85	15	Impact Tests (1907 Partial).
280	1.15	20	Fireproofing of Floor Construction (1907 Partial).
281	4.85	26	Adaptability or Suitability of Long Span Concrete Floor Construction, Use of Cinder-Concrete for the Same, together with Ec and Working Stresses Allowable (1907 Partial).
282	1.80	1	Increased Efficiency of Haunched I-Beams in Reinforced Concrete Floor Construction (1907 Partial).
303	1.60	14	Methods, Uses and Cost of Creosoting Timber (1907 Partial).
308	4.00	38	Riveted Beam Connections and Riveted Splices (1907 Complete).
321	3.60	36	References in the <i>Official Gazette</i> of the U. S. Patent Office to Reinforced Concrete Poles, Posts and Columns, 1900-Oct. 1907 (1907 Complete).
328	2.25	4	Manufacture of Scagliola or Imitation Marble (1907 Complete).
339	12.40	93	Use of Asphalt and Coal-Tar for Pipe-Dips, Metal Coatings and Water-Proofing (1908 Partial).
346	4.15	38	Decorative or Artistic Use of Structural Steel (1908 Complete).
345	5.75	52	Fireproof Coal Pockets and Grain Elevators (1908 Complete).
355	4.75	40	Metal Sheet-Piling (1908 Partial).
389	4.40	18	Coverings for Reinforced Concrete Factory Floors (1908 Partial).
412	2.50	35	List of American Periodicals on Cement, Concrete and Reinforced Concrete (1909 Complete).
413	2.35	13	Relative Value of Sand vs. Broken Stone Screenings in Cement and Concrete Work (1909 Partial).
414	12.25	51	Experiments on Wrought-Iron or Steel Compression Members, Compiled for the Special Committee on Steel Columns and Struts (1909 Complete).
420	4.50	44	Sinking Open Wells or Caissons by Processes other than Pneumatic (1909 Partial).
442	1.50	17	Test Borings for Foundations (1909 Partial).
443	20.15	86	Quicksand (1909 Partial).
446	41.65	142	Reinforced Concrete Industrial Buildings (1909 Partial).
448	1.80	20	Books on Structural Mechanics and Theory of Framed Structures by German Authors (1909 Partial).
449	4.50	36	Driving Metal Sheet-Piling (1909 Partial).
450	4.75	10	Effect of Coal Gases and Constant Heat on the Life of Steel and Concrete when Unprotected (1909 Partial).
457	19.95	164	Water-proofing of Masonry Structures (1909 Partial).
458	4.50	17	Sand Cement (1909 Partial).
471	3.50	8	Foundations in Chicago (1910 Partial).
478	1.25	2	Foundations of the St. Paul Building, New York City (1910 Partial).
483	6.50	16	Marine Wood Borers (1910 Partial).
488	2.65	10	Use of Tower Hoisting Arrangement and Spout or Conduit for Depositing Concrete, Prior to 1907 (1910 Partial).
495	5.65	70	Method used to Reinforce Large Structures, Subject to Settlement (1910 Partial).
503	.75	2	Deposition of Concrete through Pipes, by Compressed Air (1910 Partial).
509	6.55	18	Action of Sulphur Water on Cement and Concrete (1910 Complete).
511	3.75	12	Mushroom System of Reinforced Concrete Construction (1910 Complete).
516	7.50	60	Wood Piles (1910 Partial).
517	4.00	64	Preservation of Timber (1910 Partial).

## WATER SUPPLY AND WATER POWER

No.	Cost.	No. of Ref.	
254	\$260	21	Description of Hydro-Electric Power Plants of Less than 100 Feet Head on Mississippi River and Tributaries (1907 Complete).
263	1.80	3	Cost of Engineering in Hydro-Electric Developments (1907 Partial).
264	3.25	24	Cost and Methods of Construction of Reinforced Concrete Conduits (1907 Partial).
269	4.85	30	Theory and Process of Operating Siphons (1907 Complete).
270	2.25	8	Construction of Flash Boards on Dams (1907 Complete).
271	1.50	17	Undeveloped Water Powers in the United States (1907 Partial).
274	2.75	10	Experiments in the Flow of Water over an Ogee Dam (Includes Search No. 121) (1907 Complete).
275	2.65	16	Back-Water Due to the Construction of Fixed Dams (Includes Search No. 16) (1907 Complete).
284	5.40	28	On the Use of Underground Water from the Beds of Rivers (1907 Partial).
288	.75	11	Water-Works Systems for Cities, 1899-1907 (1907 Partial).
291	3.00	27	Valuation of Water Power, Particularly with Reference to Condemnation Proceedings (1907 Complete).
293	2.00	15	Work and Plans of the New York Board of Water Supply (1907 Partial).
294	2.50	2	Details of Construction of Works of the Pike's Peak Hydro-Electric Co.; Especially the Handling, Laying and Securing of the Pipes (1907 Complete).
315	.50	7	San Carlos Project for Storage of Water on Gila River, Arizona (1907 Complete).
348	4.05	12	Tongued and Grooved Sheet-Pilings as a Cut-Off Wall for Dams (1908 Partial).
360	5.40	47	Water Softening (1908 Partial).
362	16.80	106	Gate-Houses, Valves and Screens for Masonry and Earthen Dams (1908 Partial).
369	2.95	5	Methods of Keeping Canals Free from Deleterious Growths of Weeds (1908 Complete).
376	21.05	34	Large Dams or Retaining Walls that Impound Large Bodies of Water above Cities or Villages (1908 Complete).
380	2.05	5	Relation of Rainfall to Run-Off on the Watershed of Rock River, Ill. (1908 Complete).
381	6.30	53	Reinforced Concrete Conduits Five Feet or Less in Diameter (1908 Partial).
384	2.70	5	Inverted Siphons for Water Supply, Constructed in Rock (1908 Partial).
401	9.60	35	Large Siphons (1908 Partial).
408	1.80	6	Junction of Earth-Sections with Lined Sections or Flumes in Canal Construction (1909 Partial).
410	3.25	21	Conditions which Cause Stored Waters to have Fish and Oil or other Bad Tastes (1909 Partial).
411	3.15	8	Contamination of Water for City Use by Alternate Raising and Lowering of the Surface Level of Water in Ponds (1909 Partial).
415	29.30	82	Awards for Water or Water Power Diversion (1909 Partial).
416	4.05	22	Deep-Well Pumping by Compressed Air (1909 Partial).
433	.60	3	Irrigation in Texas (1909 Partial).
440	.90	9	New Orleans Sewerage and Water-Works Systems (1909 Partial).
456	11.75	78	Cast-Iron Water Pipe versus Steel, Wrought-Iron and Wooden Pipe (1909 Complete).
459	5.15	5	Animal Life in Water Supply (Snails) (1909 Partial).
465	3.50	17	Rice Irrigation in the United States (1909 Complete).
473	2.25	10	Wooden Stave Pipe, Crossing Rivers (1910 Partial).
485	2.75	13	Conduits through Earthen Embankments (1910 Partial).
494	4.00	14	Methods of Laying Submerged Cast-Iron Mains, Subject to Pressure (1910 Partial).
499	5.50	20	Spillways for Earth Dams (1910 Partial).
501	1.00	1	Preservative Coatings for Steel Mains (1910 Partial).
502	4.25	13	Specifications for Laying Cast-Iron Water Mains, about Thirty Inches in Diameter (1910 Complete).
506	3.75	11	Storage of Water for Logging Purposes (1910 Complete).
521	7.40	7	Settlement of Timber Dams on Rock Foundations (1910 Partial).
522	14.30	57	Reinforced Concrete Standpipes (1910 Complete).
524	8.94	25	Flow of Water in Cement-Lined Circular Conduits and Riveted Steel Pipe, Six Feet or Over in Diameter (1910 Partial).

## WATERWAYS

No.	Cost.	No. of Ref.	
255	\$2.00	11	Cape Cod Canal (1907 Complete).
268	4.25	6	Data Regarding the Coefficient of Friction to be Used in Calculating Resistance of Stone-Filled Timber Cribs against Sliding on Earth, Rock or Gravel Foundations (1907 Partial).
273	5.05	9	Effect of Ice Fields on Dams and Abutments (Includes Search No. 18) (1907 Complete).
276	2.00	21	Fishways (Includes Search No. 190) (1907 Partial).
286	1.25	13	Harbors Constructed on Sites with Open Roadsteads and Low Sandy Beaches (1907 Partial).
295	7.15	74	Mechanical Towing of Canal Boats Outside of the United States (1907 Partial).
296	2.50	7	Dikes for Narrowing and Rectifying a Broad Sandy Stream (1907 Partial).
299	1.45	3	Chicago Drainage Canal (1907 Partial).
300	.80	6	Manchester Ship Canal (1907 Partial).
301	1.15	6	Wharves, Bulkheads, etc. (1907 Partial).
312	4.40	20	Ocean Piers in the United States and Foreign Countries (1907 Complete).
385	.50	1	Columbia River, Oregon, Canal around the Cascades (1907 Partial).
353	4.30	57	Improvement of the Mississippi and Missouri Rivers (1908 Partial).
354	3.50	28	Floods and the Relation of Forests to Stream Flow in European Countries (1908 Partial).
363	19.55	31	Wooden Piles with an External Covering of Concrete Encased in Metal, Wood, or Earthenware (1908 Partial).
377	6.30	8	Seepage in Canals (1908 Partial).
382	3.85	42	Dredging in Harbors in Sand and Mud, Apparatus and Cost of Operation (1908 Partial).
388	6.30	84	Levees (1908 Partial).
390	4.50	23	Shore Protection by Lining with Concrete (1908 Partial).
391	3.50	2	Foundations on Coral Reefs (1908 Complete).
394	2.35	30	Proposed Lighthouse on Diamond Shoals Off Cape Hatteras (1908 Complete).
395	3.95	47	Government Publications on Lighthouses (1908 Complete).
396	1.15	17	Lighthouses (1908 Partial).
402	5.10	58	Dock Construction (1909 Partial).
405	.50	6	Galveston Sea-Wall (1909 Partial).
422	3.72	11	The Port of Philadelphia (1909 Complete).
423	3.73	17	The Port of Hamburg (1909 Complete).
430	.70	4	The Southwest Pass of the Mississippi River (1909 Partial).
432	1.35	7	Sabine Pass (1909 Partial).
434	.50	4	Improvement of Charleston Harbor (1909 Partial).
439	1.35	4	The Chalmette Docks of the New Orleans Terminal Co. (1909 Partial).
451	1.80	3	Barge Canal (1909 Partial).
482	1.90	15	Jamaica Bay, Rockaway Point and Inlet (1910 Complete).
504	9.25	17	Measurement of Dredged Material (1910 Partial).
505	3.50	9	Definition of Riprap and Stone Paving (1910 Partial).
515	13.00	81	Articles containing Illustrations of Cross-Sections of Breakwaters (1910 Partial).
523	10.40	20	Construction of Bulkheads with Foundations in Forty to Fifty Feet of Silt (1910 Partial).
533	6.50	37	Stream-Flow Data for Streams East of the Mississippi River (1910 Partial).



## ACCESSIONS TO THE LIBRARY

(From December 13th, 1910, to January 9th, 1911)

## DONATIONS \*

**FOWLER'S ELECTRICAL ENGINEER'S POCKET BOOK, 1911.**

Edited by William H. Fowler. Eleventh Annual Edition. Cloth, 6 x 4 in., illus., 47 + 575 pp. Manchester, England, Scientific Publishing Company, 1911. 1 shilling 6 pence.

The preface states that in this edition of this Pocket Book many improvements have been made in the subject-matter, in order to retain its reputation of being "the cheapest and most reliable up-to-date electrical handbook published." The Contents are: Miscellaneous Tables, etc.; Wire Tables; Magnetism and Magnetic Data; Conductors and Insulating Materials; Electric Lighting and Wiring; Comparison and Measurement of Resistances; Electrical Measuring Instruments; Electricity Meters; Primary and Secondary Batteries; Dynamos and Motors; Alternate Electric Currents; Alternators; Transformers; Alternate Current Motors; Switchboards, Circuit Breakers, and Lightning Arresters; Electrical Power Transmission and Distribution; Rotary Converters; Electric Traction; Rules and Regulations.

**ROCK DRILLS.**

Design, Construction, and Use. By Eustace M. Weston. Cloth, 9½ x 6½ in., illus., 7 + 367 pp. New York and London, McGraw-Hill Book Company, 1910. \$4.00.

It has been the author's purpose to describe and compare the leading modern makes of English, Australian, and American drills of both the piston and the hammer type, and to give such details of their actual use in metalliferous mines as will enable engineers and mine managers to choose machines suited to their particular needs and to maintain and work them at their highest efficiency. The Chapter Headings are: Historical Sketch; Standard Piston Drills; Hammer Drills; Electric Drills; Operating Rock Drills on the Surface and Underground; Piston Drills Designed to Use Air Expansively; Philosophy of the Process of Drilling Rock; Repair and Maintenance of Rock Drills; Drill Steel and Drill Bits; Explosives and Their Use; Theory of Blasting with High Explosives; Examples of Rock Drill Practice, Africa and Australia; Examples of Rock Drill Practice, America; Rock Drill Tests and Contests; Dust and Its Prevention; Notes on the Use of Compressed Air; Index.

**FOWLER'S MECHANICS' & MACHINISTS' POCKET BOOK AND DIARY, 1911.**

Edited by William H. Fowler. Third Edition. Cloth, 6 x 4 in., illus., 63 + 456 pp. Manchester, England, Scientific Publishing Co., 1911. 6 shillings.

In a secondary title it is stated that this volume contains a synopsis of practical rules for fitters, turners, millwrights, erectors, pattern makers, foundrymen, draftsmen, apprentices, students, etc., and it is also stated that this the third edition has been thoroughly revised and brought up to date. Tables from the reports of the Engineering Standards Committee on bolts, nut spanners, screw threads, and running fits are also included. The Contents are: Handy References and Tables; Mensuration, Geometry, and Trigonometry; Uses of Logarithms and Antilogarithms; Materials Used in Machine Construction; Machine Tool Design; Proportions of Machine Tool Parts; Metal Cutting Tools; High Speed Tool Steels; Drilling and Boring Metal; Screw Threads, Screw Cutting, and Taper Turning; Emery and Emery Wheels; Shop Practice; Wheel Gearing; Belt and Rope Driving; Shafting and Bearings; Lifting Chains and Ropes.

**THE MODERN MANUFACTURE OF PORTLAND CEMENT.**

A Handbook for Manufacturers, Users, and All Interested in Portland Cement. By Percy C. H. West. Vol. I.—Machinery and Kilns. Cloth, 10 x 6½ in., illus., 16 + 262 pp. New York, McGraw-Hill Book Company; London, Crosby Lockwood and Son, 1910. \$4.00.

The author states that this first volume contains descriptions of the various processes and machinery now used in the manufacture of Portland cement. A

\* Unless otherwise specified, books in this list have been donated by the publishers.



second volume, in preparation, will treat, it is stated, of the chemical and physical testing of the raw materials and finished product, the general control of the manufacturing process, and the scientific side of the subject generally. The Contents are: Introductory; Wet Process: Wash-Mills; Wet Edge-Runners and Stone-Mills; Wet Tube-Mills; Other Wet Mills and Accessory Plant; Wet Process—Conclusion. Dry Process: Introduction; Crushers; Driers; Millstones, Edge-Runners, Disintegrators, etc.; Ball-Mills; Centrifugal Roll-Mills; Tube-Mills; Conveyors and Elevators; Dust Collectors; Weighing Machines; Separators and Automatic Feeders; Pressing and Drying Briquettes. Kilns: Shaft and Other Stationary Kilns; Rotary Kilns; Coal Drying and Grinding. The Treatment of the Clinker and of the Finished Cement: Storing and Grinding the Clinker; Warehousing and Packing the Cement; Descriptions of Some Modern Cement Plants; Index.

#### FOWLER'S MECHANICAL ENGINEER'S POCKET BOOK, 1911.

Edited by William H. Fowler. Thirteenth Annual Edition. Cloth, 6 x 4 in., illus., 63 + 655 pp. Manchester, England, Scientific Publishing Co., 1911. 1 shilling 6 pence.

The information contained in this edition of the Pocket Book, is stated to have been thoroughly revised and amended in order to bring the subject-matter as nearly as possible up to date. The Contents are: Miscellaneous Tables and Formulae; Steam Boilers and Fittings; Fuels and Combustion; Steam Engines; Steam Turbines; Locomotives; Steam Tables; Valves and Valve Gear; Gas Engines; Gases Used in Gas Engines; Oil Engines; Hydraulics; Pumps and Pumping Arrangements; Gearing and Lubrication; Hoisting and Lifting Machinery; Mining Machinery and Appliances; Metallurgy of Iron and Steel; Strength of Metals and Alloys; Beams and Pillars; Springs; Chemistry; Ventilation and Heating.

#### Gifts have also been received from the following:

- |   |   |
|---|---|
| Alabama Polytechnic Inst. 1 pam.  | Moline, Ill.-City Civ. Engr. 4 pam.                               |
| Allen, W. T. 1 pam.   | New Orleans, La.-City Engr. 2 pam.                                |
| Am. Iron and Steel Assoc. 1 pam.  | Newport, England-Water-Works Dept. 1 pam.                         |
| Am. Ry. and Master Mechanics' Assoc. 1 bound vol.                                   | New York City-Dept. of Docks and Ferries. 1 bound vol., 1 pam.    |
| Am. Ry. Eng. and M. of W. Assoc. 2 vol.   | New York State-Forest, Fish and Game Comm. 1 bound vol., 1 pam.   |
| Am. Soc. Mech. Engrs. 1 bound vol.  | New York-State Engr. and Surv. 1 map.                             |
| Arkansas-Secy. of State. 1 bound vol.   | New York-State Library. 3 pam.                                    |
| Belzner, Theodore. 2 pam.   | New York State-Public Service Comm., 1st Dist. 5 pam.             |
| California-State Forester. 1 pam.   | North Dakota-Univ. of. 1 Vol.                                     |
| California-Secy. of State. 1 bound vol.   | Ohio-Chf. Insp. of Mines. 2 vol.                                  |
| California Polytechnic School. 2 pam.   | Ontario, Canada-Registrar-Gen. 1 pam.                             |
| Canada-Dept. of Mines. 3 pam.   | Pennsylvania-Dept. of Mines. 2 bound vol.                         |
| Chicago, Peoria & St. Louis Ry. Co. 1 pam.  | Philadelphia, Pa.-Dept. of Public Works. 1 vol.                   |
| Cornell Univ. 1 pam.  | Philadelphia, Pa.-Director of Public Health and Charities. 1 pam. |
| Georgia-Comptroller-Gen. 1 bound vol.   | Plainfield, N. J.-Board of Health. 9 pam.                         |
| Germany - Kaiserliche Generaldirektion der Eisenbahnen in Elsass-Lothringen. 1 vol. | Plymouth, England-Corporation Water-works. 1 bound vol., 7 pam.   |
| Great Britain-Patent Office. 4 vol.   | Richmond, Fredericksburg & Potomac R. R. Co. 1 pam.               |
| Halifax, N. S.-City Engr. 2 pam.  | Ross, Elmer W. 6 pam.   |
| Harvard Univ. 1 bound vol.  | Ruttan, H. N. 1 pam.  |
| Higgins, George. 1 pam.   | South Australia-Rys. Commr. 1 pam.                                |
| Illinois-Insurance Supt. 2 bound vol.   | South Dakota-Geol. Survey. 1 pam.                                 |
| Indiana-R. R. Comm. 1 map.  | Southern Pacific Co. 2 pam.                                       |
| Iowa-State Univ. of. 1 vol.   | Stirling, Scotland-Supt. of Water-Works. 1 pam.                   |
| Kansas, Univ. of. 2 bound vol.  | Stourbridge, England-Stourbridge and Dist. Water Board. 1 pam.    |
| Lawrence, Mass.-City Engr. 4 pam.   | Tasmania-Gen. Mgr. of the Govt. Rys. 1 pam.                       |
| Lehigh & Hudson River Ry. Co. 1 pam.  |   |
| Liverpool Eng. Soc. 1 bound vol.  |   |
| Louisiana-Secy. of State. 1 pam.  |   |
| Madras, India-Public Works Dept. 1 pam.   |   |
| Memphis, Tenn.-Artesian Water Dept. 1 bound vol., 3 pam.                            |   |
| Minnesota-State Geologist. 1 bound vol., 1 vol.                                     |   |
| Missouri Pacific Ry. Co. 1 pam.   |   |

Torquay, England-Water Engr.	1 pam.	Wakefield, England-Water-Works Engr.	1
U. S.-Bureau of Insular Affairs.	1 pam.		
U. S.-Bureau of Mines.	2 pam.	Webster, George S.	1 bound vol.
U. S.-Bureau of Yards and Docks.	1	Western Australian Inst. of Engrs.	1
	pam.		
U. S.-Dept. of Commerce and Labor.	1	Wilgus, William J.	1 pam.
	pam.	Williams, W. H.	1 pam.
U. S.-Supt. of Naval Observatory.	1	Wisconsin-State Forester.	1 pam.
	pam.	York, England-Water-Works Mgr.	1
Utah, Univ. of.	1 vol.		pam.

### BY PURCHASE

**Year-Book, 1910.** American Society for Testing Materials. Philadelphia, 1910.

**Practical Switch Work.** A Hand-Book for Track Foremen. D. H. Lovell. Myron C. Clark Publishing Company, New York, 1909.

**Standard Turn-Outs on American Railroads.** F. A. Smith. Myron C. Clark Publishing Company, New York, 1906.

**Maintenance of Way Standards on American Railways** and Rules and Instructions Governing Roadway Departments. Myron C. Clark Publishing Company, New York, 1906.

**The World Almanac and Encyclopedia, 1911.** The Press Publishing Company, New York.

### SUMMARY OF ACCESSIONS

(From December 13th, 1910, to January 9th, 1911)

Donations (including 5 duplicates).....	130
By purchase.....	5
Total.....	135

## MEMBERSHIP

## ADDITIONS

(From December 13th, 1910, to January 10th, 1911)

MEMBERS		Date of Membership.	
BLANCHARD, MURRAY. Supt., The Foundation Co., 115 Broadway, New York City.....	Assoc. M. M.	April 2, Dec. 6,	1902 1910
CHAMBERS, HERBERT JAMES. (Hamilton & Chambers, Steel Engrs. and Contrs.), 29 Broadway, New York City.....	Assoc. M. M.	Nov. 5, Jan. 3,	1902 1911
COCHRANE, VICTOR HUGO. (Hedrick & Coch- rane, Cons. Engrs.), 1118 McGee St., Kansas City, Mo.....	Assoc. M. M.	Oct. 4, Dec. 6,	1905 1910
DUIS, FREDERICK BERNHARDT. U. S. Asst. Engr., 309 South Front St., Wheeling, W. Va.....	Assoc. M. M.	Dec. 5, Jan. 3,	1906 1911
EDDY, ALBERT CLARK. Asst. Engr., Great Northern Ry. Co., 320 Second St., New Westminster, B. C., Canada.		Dec. 6,	1910
FERGUSON, JAMES EASTON. Operating Engr., The Toledo Bridge & Crane Co., Toledo, Ohio.....	Assoc. M. M.	June 1, Jan. 3,	1904 1911
FULTON, JAMES EDWARD. Civ. and Mech. Engr., 155 The Terrace, Wellington, New Zealand.....		Oct. 4,	1910
MCDANIEL, ALLEN BOYER. Prof. of Civ. Eng., Univ. of South Dakota; Cons. Eng. and Archit., Vermillion, S. Dak.....	Assoc. M. M.	Nov. 1, Dec. 6,	1905 1910
MERRIMAN, THADDEUS. Dept. Engr.; Asst. to Chf. Engr., Board of Water Supply, 165 Broadway, New York City.....	Jun. Assoc. M. M.	April 4, April 1, Dec. 6,	1889 1908 1910
ORR, JOHN. Prof. of Eng., North African School of Mines and Technology, Box 1176, Johannesburg, South Africa.....		Oct. 4,	1910
PARSONS, HAROLD ASHTON. 303 Main St., Stamford, Conn.....	Assoc. M. M.	May 1, Dec. 6,	1907 1910
RASTER, WALTHER. With E. C. & R. M. Shank- land, 6743 Perry St., Chicago, Ill.....	Jun. Assoc. M. M.	Feb. 4, Mar. 6, Dec. 6,	1902 1907 1910
RICHARDSON, JOSHUA WILSON. Chf. Engr., Vera Cruz Ter- minal Co., Ltd., Ave. Independencia No. 2, Vera Cruz, Mexico.....		Dec. 6,	1910
ROBINSON, GEORGE LOOMIS. Pres., New York Sewage Disposal Co., 1 Madison Ave., New York City.....	Jun. Assoc. M. M.	April 5, Mar. 7, Dec. 6,	1904 1906 1910
SHOEMAKER, MARSHALL NEY. Vice-Pres., Am. Concrete Steel Co., 718 Union Bldg., Newark, N. J.....	Assoc. M. M.	April 1, Jan. 3,	1903 1911

## MEMBERS (Continued.)

		Date of Membership.
WESTCOTT, FRANK THOMAS.	North Attleborough, Mass....	Jan. 3, 1911
WHITE, WILLARD OLNEY.	Cons. Civ. and Min.	
Engr., First National Bank Bldg.,	} Assoc. M.	April 3, 1907
Uniontown, Pa.....		Jan. 3, 1911
WOERMANN, FREDERICK CHRISTIAN.	Cons. and Const. Engr.,	
724 Grant Bldg., San Antonio, Tex.....		Dec. 6, 1910
WOOD, DETHIC HEWITT.	Chf. Engr., Converse	
Bridge Co., 101 Chamberlain Ave.,	} Assoc. M.	Feb. 6, 1907
Chattanooga, Tenn.....		Nov. 1, 1910

## ASSOCIATE MEMBERS

ALLEN, HAROLD DAYTON.	With C. R. R. Co. of	Jun.	April 30, 1907
N. J., 27 Wakeman Ave., Newark, N. J..	} Assoc. M.		Dec. 6, 1910
BENEDICT, HAROLD WILLOUGHBY.			
705 Third Ave., North,			
Troy, N. Y.....			Jan. 3, 1911
BINFORD, CHARLES MUNNERLYN.	Chf. Engr., Piney Min.		
Co., Riley, Raleigh Co., W. Va.....			Dec. 6, 1910
BRAUNWORTH, PERCY LEWIS.	Prin. Asst. to John M.		
Farley, White Plains, N. Y.....			Jan. 3, 1911
BUNKER, STEPHEN SANS.	Asst. Engr., Madeira-Mamoré		
Ry., Box 304, Manãos, Brazil.....			Oct. 4, 1910
BURNS, WALTER ELLIOTT.	911 O St., Sacra-	Jun.	Mar. 5, 1907
mento, Cal.....	} Assoc. M.		Dec. 6, 1910
COPE, ERLE LONG.		Jun.	Jan. 7, 1908
2318 Telegraph Ave., Berke-	} Assoc. M.		Dec. 6, 1910
ley, Cal.....			
CURFMAN, LAWRENCE EVERETT.	City Engr., 310 West Rose		
Ave., Pittsburg, Kans.....			Dec. 6, 1910
DAY, WARREN FRENCH.	Asst. Engr. with James A. Green,		
226 La Salle St., Chicago, Ill.....			Dec. 6, 1910
DOW, WILLIAM GREAR.	151 Archer Pl., Denver, Colo.....		Dec. 6, 1910
DUNLOP, SAMUEL CAMPBELL.	Asst. Engr., Charleston Sewer		
System, Office, City Engr., Charleston, S. C.....			Dec. 6, 1910
EMERSON, RAFFE.	Asst. to Gen. Mgr., Lehigh Val. R. R.,		
Bethlehem, Pa.....			June 30, 1910
FISHER, GUILLERMO GUSTAVO.	Chf. Engr.,		
Public Works of the Provincial Govt.,	} Jun.	Feb. 2, 1904	
Santa Clara, Cuba.....		Assoc. M.	Dec. 6, 1910
GAY, HOWARD SPOONER.	Asst. Engr., Viele, Blackwell &		
Buck, R. D. No. 2, Little Falls, N. Y.....			Dec. 6, 1910
GOLDSMITH, CLARENCE.	Hydr. Engr., Committee on Fire		
Prevention of National Board of Fire Underwriters,			
66 East Haverhill St., Boston, Mass.....			Dec. 6, 1910
GRANT, JOHN ROBERT.	503 Cotton Bldg., Vancouver,		
B. C., Canada.....			Jan. 3, 1911

ASSOCIATE MEMBERS (*Continued.*)Date of  
Membership.

GRISWOLD, LEE SWANEY. Junior Engr., U. S. Engr. Dept., 665 Monadnock Bldg., San Francisco, Cal.....	Dec.	6, 1910
HALL, WILLIAM HENRY. (Hall & Bacon), 272 Main St., New Britain, Conn.....	Oct.	4, 1910
HEALEY, CHARLES FRANK. 613 Bankers Trust Bldg., Tacoma, Wash.....	June	30, 1910
KAYS, MARION REED. Richfield, Idaho.....	Dec.	6, 1910
LOUCKES, FRANK IRWIN. Junior Engr., U. S. Corps of Engrs., U. S. Engr. Office, Box 72, Louisville, Ky....	Jan.	3, 1911
MCCAUSLAND, CHARLES PATTERSON. Bridge Engr., Western Maryland Ry., 709 Continental Bldg., Baltimore, Md.	Dec.	6, 1910
MARSH, FRANCIS BEAL. Asst. Engr., Board of Water Supply, 165 Broadway, New York City.....	Jun. Assoc. M.	Oct. 2, 1906 Jan. 3, 1911
MILLER, CROSBY. Asst. Engr., Estimating Dept., Bridge and Constr. Dept., Pennsylvania Steel Co., Steelton, Pa.....	Jun. Assoc. M.	Jan. 7, 1908 Jan. 3, 1911
MORSE, ROBERT BROOKS. Metropolitan Sewerage Comm., 17 Battery Pl., New York City.....	June	30, 1910
PODEWILS, OTTO CHARLES JULIUS. Chf. Estimator, George A. Just Co., 1429 Prospect Ave., New York City....	Jan.	3, 1911
RANDORF, CHARLES ANDREW. Structural Engr., Asst. to Chf. Engr., Lackawanna Steel Co., 438 Potomac Ave., Buffalo, N. Y.....	Dec.	6, 1910
RENSHAW, FRANCIS OREA. Big Stone Gap, Va.....	Jan.	3, 1911
ROGERS, AUGUSTUS WEBSTER. Standard Oil Co., Road Oil Dept., 26 Broadway, New York City.....	Nov.	1, 1910
SAYERS, EDWARD LAWRENCE. Office Engr. with Noble & Woodard, Cons. Engrs., 7 East 42d St., New York City.....	Jun. Assoc. M.	Feb. 2, 1904 Jan. 3, 1911
SCOTT, JOHN KUHN. Asst. Purchasing Agt., West. P. R. R., Room 803 Pittsburg Bank for Savings Bldg. (Res., 905 Heath St.), Pittsburg, Pa.....	Jun. Assoc. M.	Oct. 1, 1907 Dec. 6, 1910
SHEARER, CHARLES ENGLISH. Structural Engr., 710 Ran- dolph Bldg., Memphis, Tenn.....	Dec.	6, 1910
STILES, OTHO WILLIAM. City Engr., 120 West Corwin St., Circleville, Ohio.....	Dec.	6, 1910
STRICKLER, FREDERICK WINEMAN. 448 Walnut St., Mead- ville, Pa.....	Dec.	6, 1910
SUAREZ Y CORDOVES, PATRICIO ANDRES. Cen- tral "Esperanza," Calimete, Cuba.....	Jun. Assoc. M.	April 6, 1909 Nov. 1, 1910
SWENDSEN, WARREN G. (Swendsen, Swendsen & Peirce), 27 Shaw Blk., Boise, Idaho.....	Dec.	6, 1910

ASSOCIATE MEMBERS (*Continued.*)Date of  
Membership.

TENNEY, WILLIAM FIELD. Asst. Engr., N. Y. C. & H. R. R. R., 327 Holcomb St., Watertown, N. Y.....	Nov.	1, 1910
WHITBECK, LEE FIELD. Div. Engr., National Rys. of Mexico, Estacion Pénjamo, } Guanajuato, Mexico.....	Jun. Assoc. M.	Dec. 6, 1904 Nov. 1, 1910
WILLIAMS, ENRIQUE RUIZ. Locating Engr., Cuban Central Rys. Co., Ltd., Sagua La Grande, Cuba.....	Dec.	6, 1910
WILLIAMSON, HARRY. Sectional Engr., Buenos Aires & Pacific Ry. Co., Ltd., Bahía Blanca, Argentine Republic.....	Oct.	4, 1910

## ASSOCIATE

BELKNAP, ROBERT ERNEST. Chicago Sales Agt., The Penn- sylvania Steel Co., 193 Michigan Ave., Room 1007, Chicago, Ill.....	Jan.	3, 1911
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## JUNIORS

BAKER, NED DUNCAN. Engr. Insp., California State Board of Health, Sacramento, Cal.....	Dec.	6, 1910
BHAGWAT, SHANKER RAMCHANDRA. Lecturer in Eng., Coll. of Science, 192 Sadashiv Peth, Poona City, India.....	Oct.	4, 1910
BOIG, ALEXANDER FLETCHER. Asst., Penn. Bridge Co., 520 Thirty-fifth St., Beaver Falls, Pa.....	Nov.	1, 1910
BOWERMAN, EDWIN ROY. Fairport, N. Y.....	Jan.	3, 1911
BUELL, WALTER AUGUSTUS. 540 West 113th St., New York City.....	Oct.	4, 1910
CASPARI, FREDERICK WILLIAM. Asst. Engr., Baltimore Sewerage Comm., 902 American Bldg., Baltimore, Md.	Nov.	1, 1910
DAY, WARREN ELLIS. Draftsman, Oakdale Irrig. Dist., Oakdale, Cal.....	Dec.	6, 1910
EDDY, ADOLPHUS JAMES. Instr. in Civ. Eng. Dept., Univ. of California, Berkeley, Cal.....	Dec.	6, 1910
FLEEGER, BURTNER. With Pittsburg Steel Foundry Co., 428 Kelly Ave., Wilkinsburg, Pa.....	Dec.	6, 1910
GRAHAM, JOHN WILLIAM. Asst. Engr., 11th Dist., Bureau of Public Works, Cebu, Cebu, Philippine Islands....	Oct.	4, 1910
HARRINGTON, ARTHUR WILLIAM. Asst. Engr. with L. B. Cleveland, 416 Stone St., Watertown, N. Y.....	Dec.	6, 1910
KESNER, HENRY JAMES. Instr. in Civ. Eng., Univ. of California, Care, Faculty Club, Berkeley, Cal.....	Dec.	6, 1910
LEARNED, ALBERT PREISACH. Instrumentman, Cherryvale, Oklahoma & Texas Ry., Nowata, Okla.....	Dec.	6, 1910

JUNIORS (*Continued.*)

	Date of Membership.
MOORE, WALTER SMYTH. Draftsman, Louisville & Nashville R. R., 952 Fourth St., Louisville, Ky.....	Dec. 6, 1910
NAGEL, THEODORE. Supt. of Works, National Metal Moulding Co., Economy, Pa.; Address, Wilmar Apartments, Craig and Forbes Sts., Pittsburg, Pa.....	Dec. 6, 1910
POOLE, RUBLE ISAAC. Instr., Dept. of Civ. Eng., The North Carolina Coll. of Agriculture and Mechanic Arts, Lock Box 128, West Raleigh, N. C.....	Dec. 6, 1910
ROBERG, RALPH MASON. Care, H. L. Stevens Co., 510 Hall Bldg., Kansas City, Mo.....	Sept. 6, 1910
SMITH, LEWIS RUFFNER, JR. Care, Great Northern Ry. Co., Wellington, Wash.....	Dec. 6, 1910
SPEBBY, AUSTIN RUSSELL WILLARD. Chf. Insp., Associated Pipe Line Co., 2328 Webster St., Berkeley, Cal.....	Dec. 6, 1910
SUN, TAOUYH CLARENCE. Asst. Engr. on Kirin & Chang Chung R. R., 15 Peking Rd., Shanghai, China.....	Oct. 4, 1910

## RESIGNATIONS

## MEMBERS

	Date of Resignation.
AERTSEN, GUILLIAEM.....	Dec. 31, 1910
SAFFORD, VINTON PUTNAM.....	Dec. 31, 1910

## ASSOCIATE MEMBERS

JACKSON, JAMES MADISON.....	Dec. 31, 1910
NICHOLS, ADELBERT REID.....	Dec. 31, 1910
OPSAHL, HILMAR TORLEIV.....	Dec. 31, 1910
PETERSON, JOHN.....	Dec. 31, 1910
THOMAS, SAMUEL RICHARDS.....	Dec. 31, 1910

## ASSOCIATES

PIPER, ALEXANDER ROSS.....	Dec. 31, 1910
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## JUNIORS

APPLE, CHARLES E.....	Dec. 31, 1910
BENTON, LEWIS STEUERWALD.....	Dec. 31, 1910
DOE, CHARLES LEE.....	Dec. 31, 1910
GAST, E. ALBERT.....	Dec. 31, 1910
GREENE, FRANCIS INGRAHAM.....	Dec. 31, 1910
KETCHUM, MORRIS.....	Dec. 31, 1910
LIBBEY, JAMES TEMPLETON.....	Dec. 31, 1910
SHIEBLER, MARVIN.....	Dec. 31, 1910
WILDER, ALVIN DUMOND.....	Dec. 31, 1910



## DEATHS

BELL, HENRY PURDON. Elected Member, June 4th, 1884; date of death unknown.

BROWNE, WILLIAM ROBERT. Elected Member, June 1st, 1898; died September 3d, 1908.

WATSON, WILLIAM PARSONS. Elected Member, June 1st, 1887; died December 19th, 1910.

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Total Membership of the Society, January 10th, 1911,

5 814.

## MONTHLY LIST OF RECENT ENGINEERING ARTICLES OF INTEREST

(December 13th, 1910, to January 7th, 1911)

NOTE.—This list is published for the purpose of placing before the members of the Society, the titles of current engineering articles, which can be referred to in any available engineering library, or can be procured by addressing the publication directly, the address and price being given wherever possible.

### LIST OF PUBLICATIONS

In the subjoined list of articles, references are given by the number prefixed to each journal in this list:

- |  |   |
|--|---|
| (1) <i>Journal</i> , Assoc. Eng. Soc., 31 Milk St., Boston, Mass., 30c.            | (28) <i>Journal</i> , New England Water-Works Assoc., Boston, Mass., \$1.                         |
| (2) <i>Proceedings</i> , Engrs. Club of Phila., 1317 Spruce St., Philadelphia, Pa. | (29) <i>Journal</i> , Royal Society of Arts, London, England, 15c.                                |
| (3) <i>Journal</i> , Franklin Inst., Philadelphia, Pa., 50c.                       | (30) <i>Annales des Travaux Publics de Belgique</i> , Brussels, Belgium.                          |
| (4) <i>Journal</i> , Western Soc. of Engrs., Monadnock Bldg., Chicago, Ill.        | (31) <i>Annales de l'Assoc. des Ing. Sortis des Ecoles Speciales de Gand</i> , Brussels, Belgium. |
| (5) <i>Transactions</i> , Can. Soc. C. E., Montreal, Que., Canada.                 | (32) <i>Mémoires et Compte Rendu des Travaux</i> , Soc. Ing. Civ. de France, Paris, France.       |
| (6) <i>School of Mines Quarterly</i> , Columbia Univ., New York City, 50c.         | (33) <i>Le Génie Civil</i> , Paris, France.   |
| (8) <i>Stevens Institute Indicator</i> , Stevens Inst., Hoboken, N. J., 50c.       | (34) <i>Portefeuille Economiques des Machines</i> , Paris, France.                                |
| (9) <i>Engineering Magazine</i> , New York City, 25c.                              | (35) <i>Nouvelles Annales de la Construction</i> , Paris, France.                                 |
| (10) <i>Cassier's Magazine</i> , New York City, 25c.                               | (37) <i>Revue de Mécanique</i> , Paris, France.   |
| (11) <i>Engineering</i> (London), W. H. Wiley, New York City, 25c.                 | (38) <i>Revue Générale des Chemins de Fer et des Tramways</i> , Paris, France.                    |
| (12) <i>The Engineer</i> (London), International News Co., New York City, 35c.     | (41) <i>Modern Machinery</i> , Chicago, Ill., 10c.  |
| (13) <i>Engineering News</i> , New York City, 15c.                                 | (42) <i>Proceedings</i> , Am. Inst. Elec. Engrs., New York City, 50c.                             |
| (14) <i>The Engineering Record</i> , New York City, 12c.                           | (43) <i>Annales des Ponts et Chaussées</i> , Paris, France.                                       |
| (15) <i>Railway Age Gazette</i> , New York City, 15c.                              | (44) <i>Journal</i> , Military Service Institution, Governors Island, New York Harbor, 50c.       |
| (16) <i>Engineering and Mining Journal</i> , New York City, 15c.                   | (45) <i>Mines and Minerals</i> , Scranton, Pa., 20c.  |
| (17) <i>Electric Railway Journal</i> , New York City, 10c.                         | (46) <i>Scientific American</i> , New York City, 8c.  |
| (18) <i>Railway and Engineering Review</i> , Chicago, Ill., 10c.                   | (47) <i>Mechanical Engineer</i> , Manchester, England.  |
| (19) <i>Scientific American Supplement</i> , New York City, 10c.                   | (48) <i>Zeitschrift</i> , Verein Deutscher Ingenieure, Berlin, Germany.                           |
| (20) <i>Iron Age</i> , New York City, 10c.   | (49) <i>Zeitschrift für Bauwesen</i> , Berlin, Germany.   |
| (21) <i>Railway Engineer</i> , London, England, 25c.                               | (50) <i>Stahl und Eisen</i> , Düsseldorf, Germany.  |
| (22) <i>Iron and Coal Trades Review</i> , London, England, 25c.                    | (51) <i>Deutsche Bauzeitung</i> , Berlin, Germany.  |
| (23) <i>Bulletin</i> , American Iron and Steel Assoc., Philadelphia, Pa.           | (52) <i>Rigasse Industrie-Zeitung</i> , Riga, Russia.   |
| (24) <i>American Gas Light Journal</i> , New York City, 10c.                       | (53) <i>Zeitschrift</i> , Oesterreichischer Ingenieur und Architekten Verein, Vienna, Austria.    |
| (25) <i>American Engineer</i> , New York City, 20c.                                | (54) <i>Transactions</i> , Am. Soc. C. E., New York City, \$4.                                    |
| (26) <i>Electrical Review</i> , London, England.                                   | (55) <i>Transactions</i> , Am. Soc. M. E., New York City, \$10.                                   |
| (27) <i>Electrical World</i> , New York City, 10c.                                 | (56) <i>Transactions</i> , Am. Inst. Min. Engrs., New York City, \$5.                             |

- (57) *Colliery Guardian*, London, England.
- (58) *Proceedings, Engrs.*, Soc. W. Pa., 803 Fulton Bldg., Pittsburg, Pa., 50c.
- (59) *Transactions, Mining Inst. of Scotland*, London and Newcastle-upon-Tyne, England.
- (60) *Municipal Engineering*, Indianapolis, Ind., 25c.
- (61) *Proceedings*, Western Railway Club, 225 Dearborn St., Chicago, Ill., 25c.
- (62) *Industrial World*, 59 Ninth St., Pittsburg, Pa.
- (63) *Minutes of Proceedings*, Inst. C. E., London, England.
- (64) *Power*, New York City, 20c.
- (65) *Official Proceedings*, New York Railroad Club, Brooklyn, N. Y., 15c.
- (66) *Journal of Gas Lighting*, London, England, 15c.
- (67) *Cement and Engineering News*, Chicago, Ill., 25c.
- (68) *Mining Journal*, London, England.
- (70) *Engineering Review*, New York City, 10c.
- (71) *Journal, Iron and Steel Inst.*, London, England.
- (71a) *Carnegie Scholarship Memoirs*, Iron and Steel Inst., London, England.
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- (83) *Progressive Age*, New York City, 15c.
- (84) *Le Ciment*, Paris, France.
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- (88) *Bulletin of the International Ry. Congress Assoc.*, Brussels, Belgium.
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- (91) *Transactions*, Soc. Naval Archts. and Marine Engrs., New York City.
- (92) *Bulletin*, Soc. d'Encouragement pour l'Industrie Nationale, Paris, France.
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- (99) *Proceedings*, Am. Soc. of Municipal Improvements, New York City, \$1.50.
- (100) *Professional Memoirs*, Corps of Engrs., U. S. A., Washington, D. C., \$1.
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- (102) *Organ für die Fortschritte des Eisenbahnwesens*, Wiesbaden, Germany.
- (103) *Mining and Scientific Press*, San Francisco, Cal., 10c.
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- (105) *Metallurgical and Chemical Engineering*, New York City, 25c.

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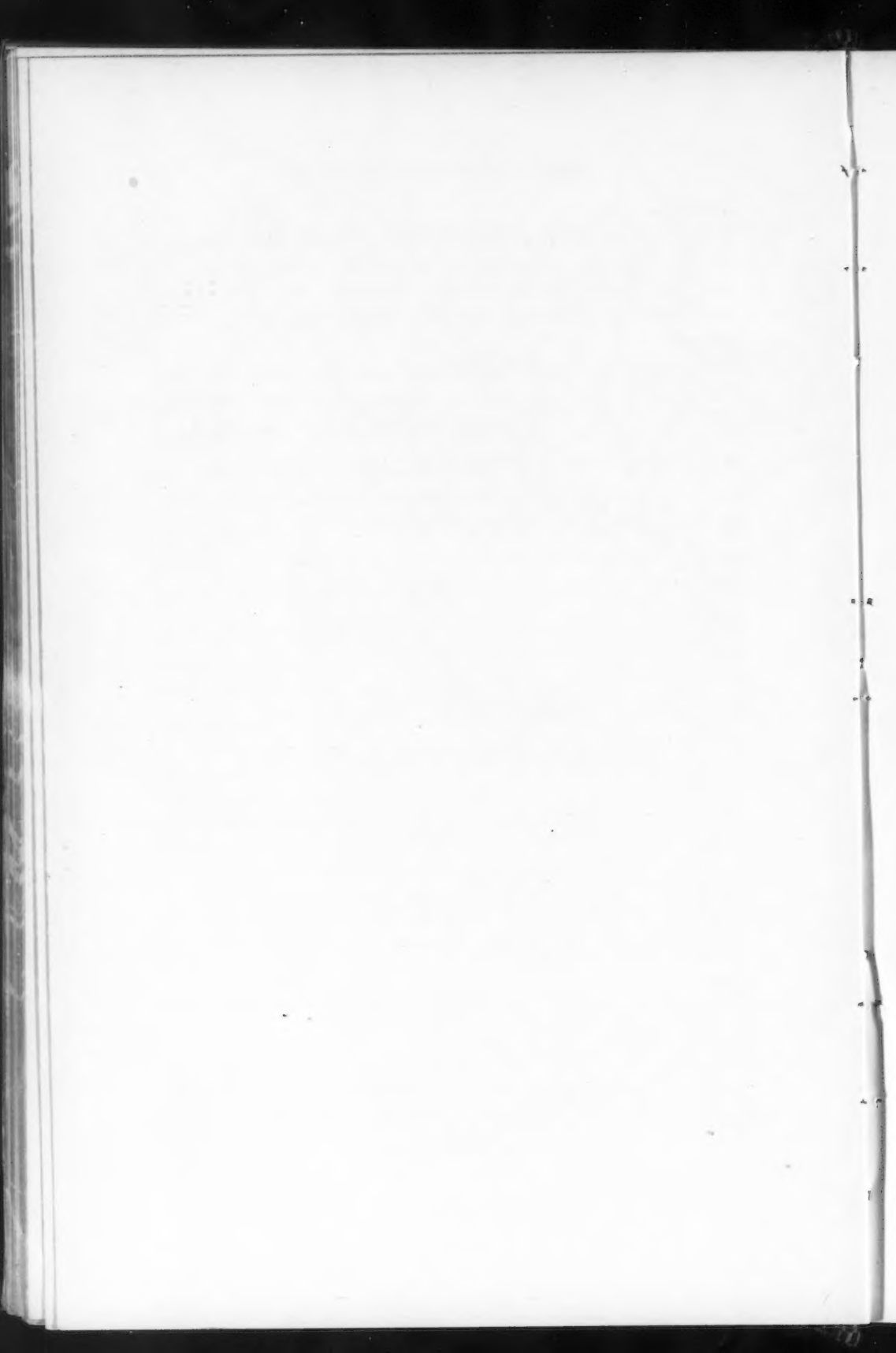
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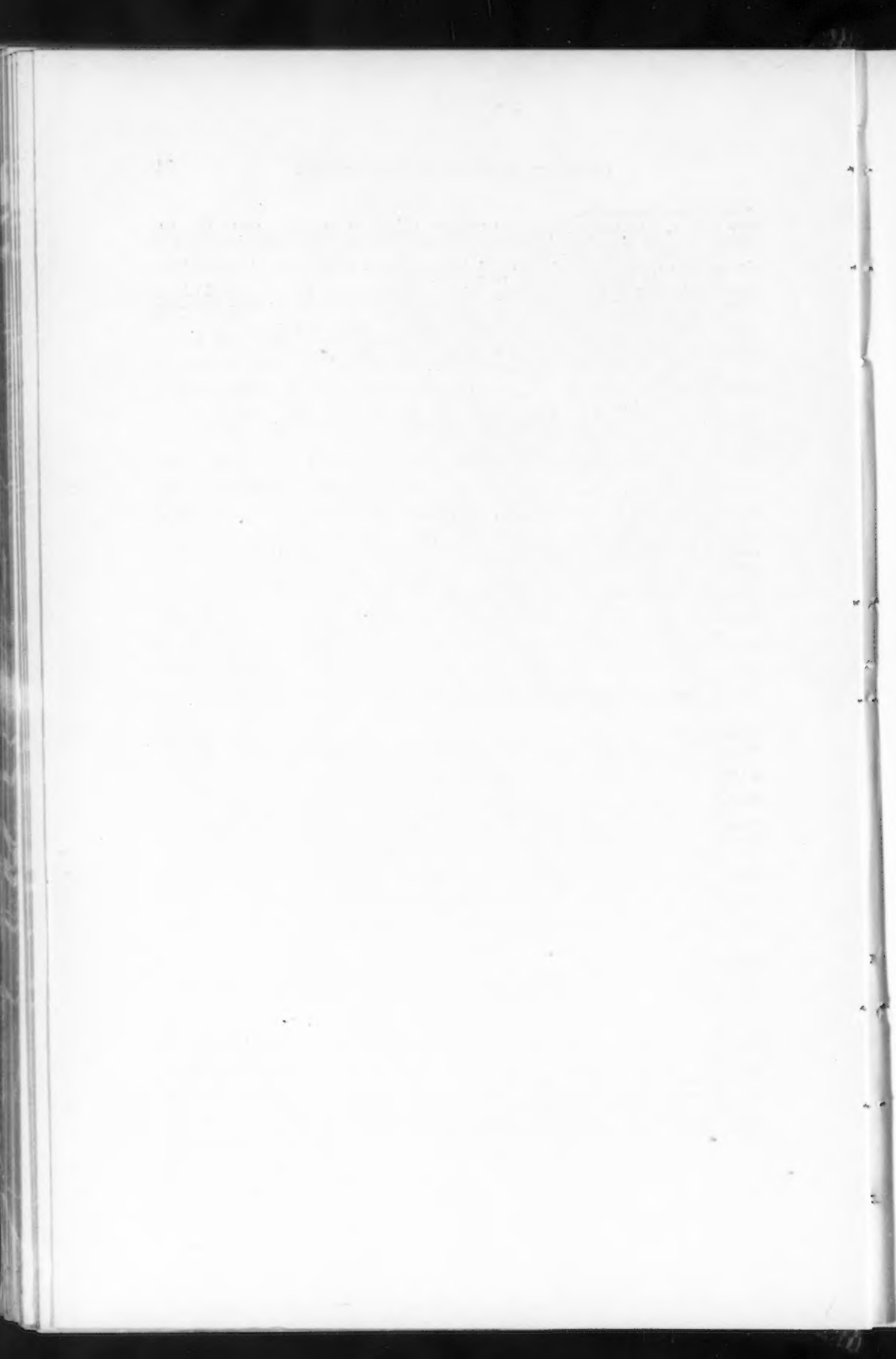
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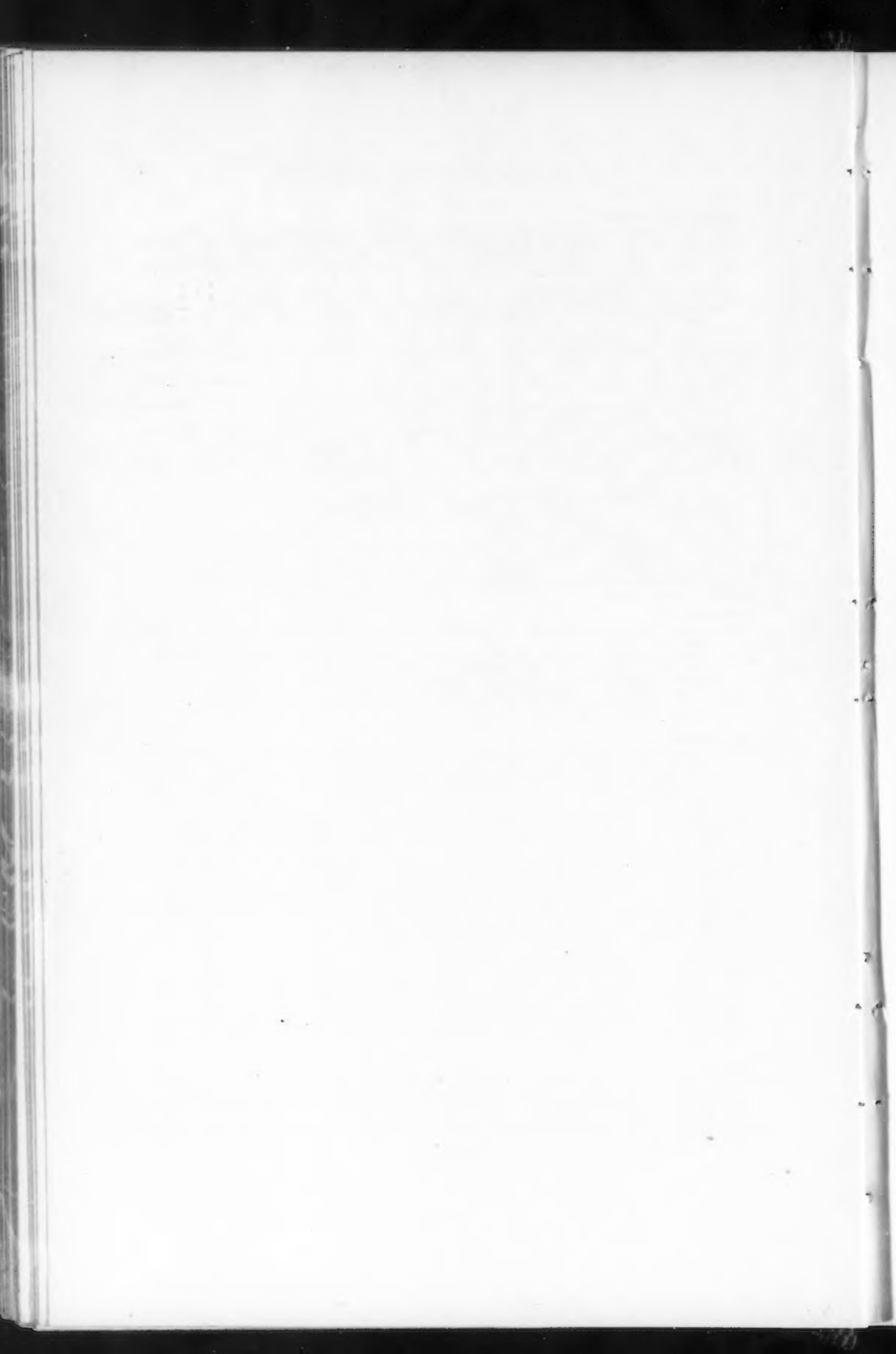
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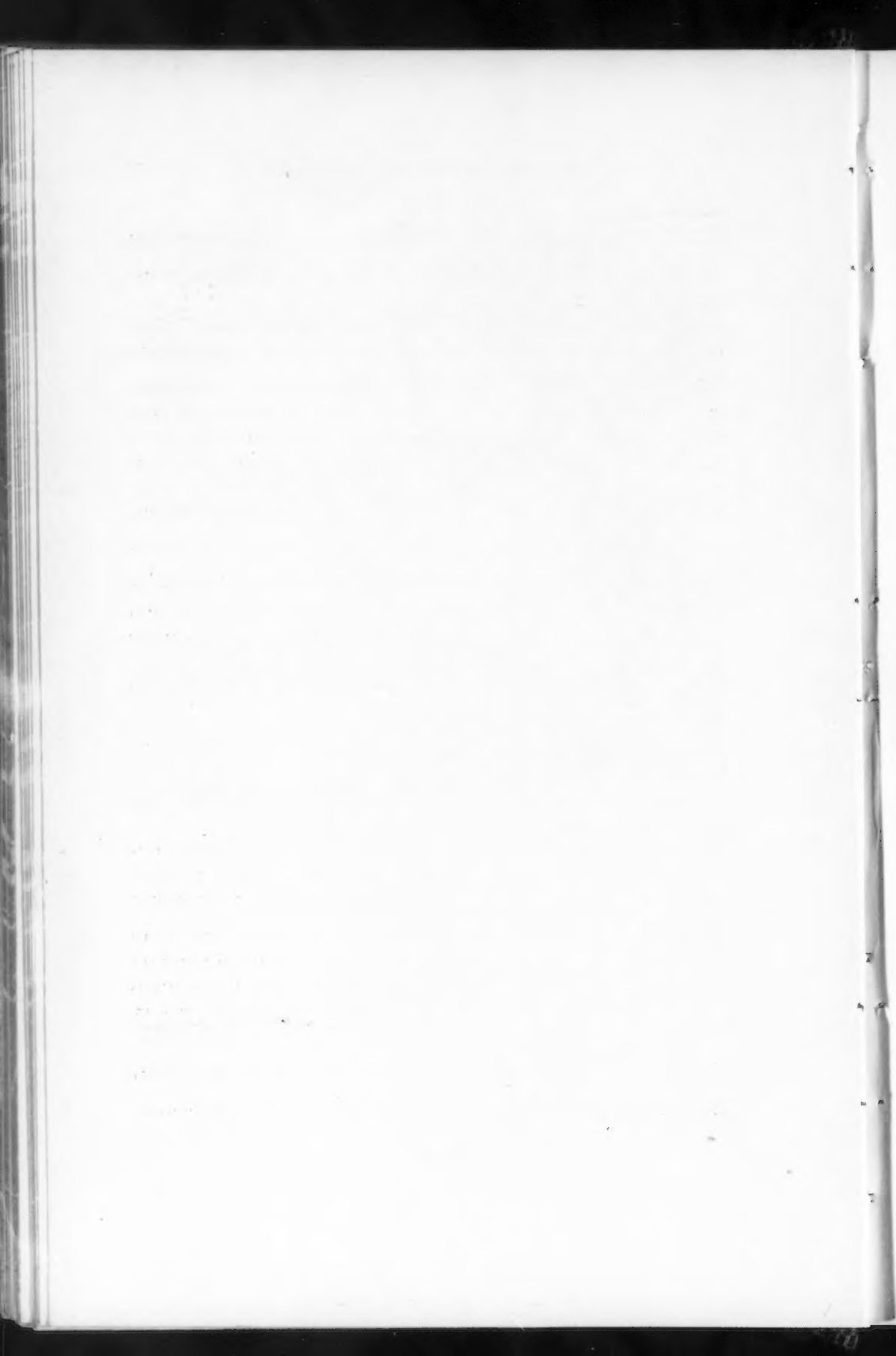
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